ANALYSIS OF DAIRY MARKETING CHAIN: IN THE CASE OF GONDAR TOWN AND THE NEARBY RURAL KEBELES, NORTHWEST ETHIOPIA

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ABSTRACT

From the framework that defines the scope of the marketing function; at the heart of this framework the marketing channel importance is to serve as a link between the customer and various processes within the firm (Day 1994). This study aims to analysis of dairy marketing chain; in the case of Gondar town and the nearby rural kebeles, northwest Ethiopia. Its main objective was to investigate dairy marketing chains; in the case of Gondar town and the nearby selected kebeles, northwest Ethiopia. More specifically, the study was able to identify the structure of milk and butter production and marketing chain in the study area, to estimate the costs and returns (profits) in traditional milk and butter marketing chain, to describe the apparent determinant factors of supply and demand in the market chain supplying to Gondar town, and to explore challenges of dairy production and marketing in the study area. Raw facts was collected based on household survey through questionnaire, interview, observation and document analyses and presented in to percentage, mean, Chi-Square and F-test analyzed by SPSS software. Data was collected at household level. Information on household, milk and butter production, marketing management condition was collected. The researcher uses systematic random sampling for the selection of the population as a representative of the special administration zone of Gondar town. The population is stratified in to producers, traders and end users. 134 total sample populations was computed from producers and traders applied by Cochran *formula (1977) and dislocating in to two. Then after, qualitative and quantitative data was collected to study sample populations of 134 as a survey and case study methods of changes of variables in the study area in specific and to suggest at the woreda level at all. A result of demographic and socio-economic characteristics of dairy producers' retailers was* analyzed in percentage and Chi-square, and except sex and age, show significance difference. *Lactation period with respect to the three farm types was occurred a great variation and dairy production was significance difference per day while the costs was no difference. The dairy market actors were farm association producers and reach to final consumers through retailers and Fasil milk cooperatives. Major problems of dairy marketing were training, experiences, and educational status, Season of demand and supply and labor shortage. Finally recommendation was given based on the findings.*

CHAPTER ONE: INTRODUCTION

1.1. Background of the Study

Dairy farming refers to rearing of dairy cattle in large and small scale for the purpose of production of milk for sale in the domestic market (Wawira, 2012). FAO Report (2011), notes that dairy farming is the second largest contributor to GDP in the agricultural sector and it contributes greatly to the Kenyan economy and keeps improving the gross national product. There is a great demand for dairy products both nationally and internationally with almost every homestead consuming at least a liter daily. To link up the dairy farmer and the consumer there needs to be appropriate milk distribution channels (FAO, 2012). Distribution channels are one or more companies or individuals who participate in the flow of goods and services from the manufacturer to the final user or consumer.

The 2012 SNV dairy sub-sector study established that the large-scale commercial dairy sector has two subcategories of registered commercial dairy farms and company dairy farms. Large-scale commercial dairy farms are characterized by large herds, commercial husbandry practices and linkages with formal markets. Company dairy farms, on the other hand, are characterized by vertical integration with both production and processing. National milk intake has fluctuated from 238 million liters rising to a peak of 262 million liters in 1990 and a low of 37 million liters in 2009 and has since picked to 51 million liters in 2011.

Despite the efforts by the donor community and government, the contribution of milk coming from the small-holder dairy sector has remained fairly insignificant (3%). Milk production within the small-holder sector fluctuated from 2.7 million liters in 1990 to 1.5 million liters in 1998 and 1.13 million liters in 2011.

Dairy farming represents one of the livelihood options for livestock keepers in the developing world that provides cash to dairy farmers, especially small holder (FAO, 2011).

The dairy sector in Eastern and Southern Africa is dominated by the small-holder producers who keep a few head of cattle on small pieces of land, usually less than 3 ha and often under a mixed crop-livestock production system. In Uganda, small-holder producers own over 90% of the national herd of about 7.5 million cattle and almost all the small ruminants and produce over

80% of the milk in the country. Dairy farmers especially small scale farmers in Uganda, mainly pastorates and mixed crop livestock farmers are currently facing a number of challenges in the production and marketing of their produce following the implementation of various policy and institutional reforms. Recent policy changes such as liberalization, privatization, decentralization, and globalization have generated new challenges for the small scale producers who now have to compete with global giants in the market place (David Wozemba & Nsanja, 2013).

The importation and/or dumping of cheap dairy products from developed countries that directly subsidize the production and export operations is a key concern to producers in Uganda and other developing countries. Dairy farmers are also facing new challenges resulting from the need to exploit emerging trade opportunities created by the different partnership arrangements between African states such as Common Market for Eastern and Southern Africa (COMESA) and East Africa Community (EAC).

According to Quaedackers (2009) the livestock sector in Tanzania is estimated to contribute 5% to 7% of national gross domestic product (GDP), and the dairy sector makes up 30% of that percentage. It is estimated that, out of the 21 million cattle in Tanzania, about 680 000 are dairy cattle mainly crosses of Friesian, Jersey, and Ayrshire breeds with the Tanzania Shorthorn Zebu (TSZ) (RLDC, 2009). The rest are indigenous cattle raised as dual purpose animals to provide milk and meat. Apart from milk, dairy animals also provide manure, other marketed products such as calves and culling as well as other intangible benefits such as insurance and status symbol.

The national livestock population over the last seven years has experienced steady growth in Uganda. The growth has been attributed to the increasing demand for milk by consumers and milk processing plants, better herd management, adoption of improved breeds and improved animal health and support services. In 2005/06 Uganda National Household Survey (UNHS), the number of agricultural households was estimated to be 4.2m or 78.8% of all the households. Only 2.5m households are engaged in milk production. Uganda's national herd was 7.5 million, with a composition of 1.3million either exotic or crossed bread and 6.2million indigenous cattle.

The important roles of livestock in the developing countries within the agricultural sector in contributing to rural livelihoods and particularly those of the poor are well recognized (Upton, 2004). Livestock and their products are estimated to make up about a third of the total value of agricultural gross output in the developing countries, and this share is rising from time to time (Woldemichael, 2008). Livestock production in these countries is increasing rapidly in response to the fast growing demand for livestock products resulting from increasing population especially that of urban areas, and rising consumer income and the sector is found to play an increasing role in urban areas.

Ethiopia is believed to have the largest livestock population in Africa. This livestock sector has been contributing considerable portion to the economy of the country and still promising to rally round the economic development of the country. The total cattle population for the country is estimated to be about 53.99 million. Out of this the female cattle constitute about 55.48% and the remaining 44.52% are male cattle and 98.95% of the total cattle in the country are local breeds and remaining are hybrid and exotic breeds that accounted for about 0.94% and 0.1%, respectively (CSA, 2012).

In Ethiopia, producers and consumers are spatially separated; most producers are found in the rural areas while consumers or profitable market is found in urban areas. Most of the milk supply is distributed from producer to consumer through informal marketing channels in both rural and urban areas.

Market infrastructures and marketing facilities are not well developed in the country. This, in turn, reduces incentives to participate in economic transactions and results in subsistence rather than market-oriented production systems. Therefore, improving the position of smallholders to actively engage in the dairy market is one of the most important development challenges of the country (Holloway et al., 2002).

Taking into consideration the human population growth rate of about 2.9% per annum and the likely increase in demand for dairy products especially in the urban areas, milk production is expected to grow in Ethiopia at a rate of 3.8-4% annually until 2020 (Holloway et al., 2000). Given, the option of income earnings from local and cross breed cows, both town and rural dairy farm producers' supply milk and butter to the retailers and consumers considered as an option for

improving the household's poverty status. Therefore, the objective of this study will be planned to assess dairy marketing chain; in the case of Gondar town and nearby selected *kebeles*, northwest Ethiopia.

Dairy Marketing Services (DMS) is a milk marketing organization formed for the purpose of creating efficiencies and reducing costs of milk assembly, field services, and transportation. It serves farmers by working to streamline the milk marketing system, and serves processors by being better able to meet their needs, (Dairy Marketing Service, 2003).

In recent years the cooperative milk marketing channel has been quite active in information dissemination in Kenya's liberalized milk market. Although the cooperatives offer the lowest price, they have significantly contributed to rural development in Kenya (Wambugu et al., 2011). They transport milk for members, provide inputs on credit and also enjoy significant economies of scale which are expected to minimize their operation costs. They, however, face stiff competition from alternative cash oriented marketing channels such as traditional channels (small scale milk vendors, large traders) and the organized private channels.

1.2. Statement of the problem

The dairy sector is one of the critical sectors in Uganda, COMESA and East African Community (EAC), with high potential for improving food security and welfare. Recent analysis provides clear evidence of increasing demand for dairy products (and other foods of animal origin) in Sub Saharan Africa (SSA) and other developing regions of the world as a result of rapid population growth, urbanization and increasing purchasing power (SNV, 2012).

Regardless of the various initiatives, the growth pace of the industry in terms of volume of milk production is so slow because of a number of structural problems including high cost of production, weak and seasonality of demand, lack of farm and industry management skills, prevalence of animal diseases, recent power cut, lack of sufficient land, low level of availability of breeds and top of all the absence of comprehensive dairy policies (UNIDO, 2009).

Challenges and problems for dairying vary from one production system to another and/or from one location to another. The structure and performance of livestock and its products marketing both for domestic consumption and for export is generally perceived poor in Ethiopia.

Underdevelopment and lack of market-oriented production, lack of adequate information on livestock resources, inadequate permanent trade routes and other facilities like feeds, water, holding grounds, lack or non-provision of transport, ineffectiveness and inadequate infrastructural and institutional set-ups, prevalence of diseases, illegal trade and inadequate market information (internal and external) are generally mentioned as some of the major reasons for the poor performance of this sector(Belachew and Jemberu 2003; Ayele et al. 2003).

Like most developing countries in Africa, Ethiopia did not have a clear livestock and livestock development policy for many years up until the establishment of Livestock Marketing Authority (LMA) in 1998. Livestock development projects are formulated on the basis of the overall government policy in the Agricultural sector. In many instances, policy decisions on livestock product marketing in the country seem to be taken in the absence of vital information.

Furthermore, dairy product marketing channels and their characteristics have not yet been studied and analyzed for different parts of the country. This seems the case because there were very few researches done on livestock and livestock products marketing. Earlier studies on local and regional dairy products market in the country include Holloway et al., (2000); Yigezu (2000); Muriuki and Throne (2001) and Mohammed et al. (2004).

Little information is shared amongst and between actors in the value chain of dairy marketing. Dairy farmers are well aware of the capacity constraints of milk collection centers. During peak periods of production, some farmers have their milk turned away because milk collection centers are not organized with transporters to coordinate additional pick -up and deliveries, nor do they have up-to-date price information from processors this is true in areas were cooperatives are not fully operational (Central, Mid-Western & Eastern Uganda), (UNHS, 2005/06).

Market opportunities for farmers and milk collection centers are largely informal in Uganda. With the existing processing capacity at such low levels, little coordination between farmers and processors, and not enough demand for pasteurized or value-added products, most dairy farmers have established relationships with fresh-milk kiosks, or have opened and run their own informal marketing channels with a consumer base of limited purchasing power. The milk marketing chains are therefore two fold; the processed milk chain and unprocessed milk chain. The boundaries between the two chains are at times porous and continuous shifting. Since the

vendors and some licensed traders have no regular suppliers, they receive milk of variable quality.

However, the informal/unprocessed milk chain is flexible enough to undercut the prices offered by the processors more regular and upfront through payments. Given their lower overhead costs, vendors and licensed traders have managed to out-compete the formal/processed milk chain and this has constrained the growth of the milk industry (Wozemba, & Rashid, 2008).

Planners should consider the relative efficiency of alternative milk marketing systems in terms of costs and marketing margins, product hygiene and quality, range and stability of services offered and stability of producers and consumer prices. One of the necessary conditions for increased milk production is the provision of assured marketing outlets that are sufficiently remunerative to producers. Experiences from India, Uganda and Kenya revealed marketing outlet as a key initiator of milk production to smallholders (Gatwech, 2012).

Ethiopia has the leading livestock population in Africa, estimated to be 81 million livestock population (CSA, 2006) and the sector plays a vital role in the overall development of the country's economy. Yet, the existing income generating capacity of livestock and livestock products as compared to its immense potentials in the country has not been exploited. The primary reason among others seems to be the inefficient livestock and livestock product marketing characterized by high margins and poor marketing facilities and services. The price gap between terminal and primary markets seems to be too wide (CSA, 2006). Under these conditions, producers have no incentives to improve the quality of their animals' products through appropriate management practices.

Consequently, dairy product marketing studies become essential to provide vital and valid information on the operation and efficiency of dairy product marketing system for effective research, planning and policy formulation. This study therefore has attempted to contribute to filling the information gap by investigating the milk and butter marketing chains and factors affecting milk supply in Gondar Town and the nearby selected *kebeles*, Northwest Ethiopia.

1.3. Research questions

i. What is the structure of milk, butter production and marketing chain in the study area?

ii. What are the costs and returns (profits) of traditional milk and butter marketing chain?

iii. What are the apparent determinant factors of supply and demand in the marketing chain supplying to Gondar town?, and

iv. What are the challenges of dairy production and marketing in the study area?

1.4. Objectives

1.4.1. General objectives

The general objective of the study was to investigate dairy marketing chains; in the case of Gondar town and the nearby selected *kebeles*, northwest Ethiopia.

1.4.2. Specific objectives

- To identify the structure of milk, butter production and marketing chain in the study area,
- To estimate the costs and returns (profits) in traditional milk and butter marketing chain operations,
- To describe the apparent determinant factors of supply and demand in the marketing chain supplying to Gondar town, and
- To explore the challenges of dairy production and its marketing chain in the study area.

1.5. Significance of the study

Understanding the effect of dairy marketing chain on productivity of milk and milk product (butter), distributors of retailers, cooperatives and consumers are a critical issue for designing appropriate dairy marketing chain development policies and strategies. Therefore, the result of this study may serve as an input for policy makers and planners in designing and implementation of dairy marketing chain strategies. Secondly, this study may serve as a baseline for the agricultural development agents of the *kebeles* and special administration zone of Gondar. Lastly, the study will also be devoted towards the benefits of farmers and cooperative societies in terms of the knowledge supplementation regarding market chain. Furthermore, this study may be serving as a reference for other researchers to carry out more comprehensive research.

1.6. Scope of the study

This research was conducted to analyze the dairy marketing chain; in the case of Gondar town and nearby selected *kebeles*, Northwest Ethiopia. The study area experiences in temperate (W*oina Dega)* agro- ecological zones. The study was focused on only major dairy derivatives (fluid milk and butter) supply and marketing chains analysis in the study area. Methodologically both descriptive and triangulation study designs were used.

1.7. Limitation of the study

When doing this thesis, during data collection, the researcher regularly visited the study sites to communicate with household members, but they were not voluntary to devote their time especially in time of FGD, due to they gave for their working day in advance. But, by communicating with rural development agents and the *Kebele* leaders, and it was already adjusted to get them during their non-working days to grasp full information, thereby data was collected. The other limitation was that, this thesis might not include the full variables of biophysical elements such as availability of fodder or grazing land size, water, topography/rock; which aid in the production of livestock and their products, due to time and economic resources.

In addition, the study sites of dairy farm sites was purposively selected which might be biases a certain rural isolated farm steads due to their farthest location that again require time and money resource. As a result, this survey data might not be enough to capture the production costs of the

biophysical factors of the area. Therefore, further research for better understanding had better great importance to conduct. Despite these limitations, the study has expected to generate valuable information which might be of great use to different stakeholders.

1.8. Organization of the paper

Background of the study, the research problem, objectives, significance and scope of the study were the main body incorporated in the first chapter. In the second chapter, the works of previous scholar's relevant literature related to dairy marketing chain were discussed in detail. Brief description of the study areas and the research methodology used in this study were presented in the third chapter. In the fourth chapter, findings from the household survey, on-site inspections, focus group discussions, key informants interview, discussion with staffs of Gondar town *district* agricultural officers and secondary sources were presented and analyzed using descriptive statistics and T-test. In the final chapter, conclusions, managerial implications and possible recommendations were presented for future development of dairy marketing chain in the study area.

CHAPTER TWO

LITERATURE REVIEW

2.1. The dairy marketing chain and its importance in marketing management practices

The Oxford dictionary defines that dairy is a substance containing or made from milk concerned with or involved in the production of milk. Milk is the secreted fluid of the mammary glands of female mammals. Since the earliest times, mankind has used the milk of goats, sheep and cows as food. Today the term 'milk' is synonymous with cows' milk. The milk of other animals is spelled out, e.g. sheep milk or goat milk, when supplied commercially (Berlitz,1999). Milk can be divided into two categories, liquid milk and manufacturing milk. Liquid milk refers to milk used for direct human consumption or 'drinking milk', while manufacturing milk refers to milk used in the production of milk products such as cheese, yogurt and milk powders.

2.1.1. A marketing chain: Defines the flow of commodities from producers to consumers that brings into place economic agents who perform complementary functions with the aim of satisfying both producers and consumers (Islam et al., 2001). A marketing chain may link both formal and informal market agents. A marketing chain may connect one or more milk or dairy sheds.

Formally, a marketing channel is a business structure of interdependent organizations that reach from the point of product origin to the consumer with the purpose of moving products to their final consumption destination (Koler et al., 2003). This channel may be short or long depending on kind and quality of the product marketed, available marketing services, and prevailing social and physical environment (Islam et al., 2001).

2.1.2. Producer-Customer: Fubio (2007), argues that the producer customer is the shortest channel in which no middlemen is involved and producers directly sell their products to the consumers. The authors assert that it fast and economical channel of distribution. Under it, the producer or entrepreneur performs all the marketing activities himself and has full control over distribution.

A producer may sell directly to consumers through door-to-door salesmen, direct mail or through his own retail stores. Big firms adopt this channel to cut distribution costs and to sell industrial products of high value. Small producers and producers of perishable commodities also sell directly to local consumers.

2.1.3. Producer-Retailer-Customer: According to Fubio (2007), the producer retail channel of distribution involves only one middlemen called 'retailer'. Under it, the producer sells his product to big retailers (or retailers who buy goods in large quantities) who in turn sell to the ultimate consumers. This channel relieves the manufacturer from burden of selling the goods himself and at the same time gives him control over the process of distribution. This is often suited for distribution of consumer durables and products of high value.

2.1.4. Dairy Cooperatives: Theoretically, a common form of collective action to address access problem to market is assumed to be participatory, producer-led cooperative that handles input purchasing and distribution and output marketing usually after some of bulking or processing. The dairy cooperatives of the milk shed accounts for about 17.2% of total milk marketed in the milk shed per day (Woldemichael, 2008).

2.1.5. Producer→ Cooperative→ Retailer→ Consumer: The channel account for 2.2% and 46.9% of total milk marketed per day in *Hawassa* and *Shashemane*, respectively. It seems to be less important as compared to other marketing channels in *Hawassa*. This seems the case because of limited volume of milk sold through cooperative *Hawassa* (Woldemichael, 2008).

2.1.6. Producer→ Cooperative→ Consumer: The channel was exceptional for *Shashemane* and *Hawassa* where dairy cooperative are found and accounts for 0.81% and 10.67% of total milk marketed per day in *Hawassa* and *Shashemane*, respectively during the survey period. This channel was identified to be the least important milk sale out let for *Hawassa* producers as they have relatively larger number of milk sale out lets which can fetch them better price (Woldemichael, 2008).

2.1.7. Marketing chain Importance in marketing management practices: From the framework that defines the scope of the marketing function, at the heart of this framework the marketing channel importance is to serve as a link between the customer and various processes within the firm (Day 1994). Therefore, we expect that, as the marketing function develops knowledge and skills related to each of these connections, the perceived value of the function within the organization will increase. To clarify terms, we define the value of the marketing function within the firm as the degree to which it is perceived to contribute to the success of the firm relative to other functions. The value of the marketing function relative to other functions was selected to provide a common frame of reference across firms for thinking about the marketing function's contributions.

Choosing the right mix of marketing channels includes considerations of many factors, including sales volume, risk, lifestyle preference and stress aversion, labor requirement, and channel specific costs (Matthew, 2010). Matthew (2010) further explained the description of each of the factors that contribute to a channel's "performance." The importance assigned to each of these factors is unique to the individual farms. Additionally the nature of highly perishable goods, along with in the risk and potential sales volume of particularly channels, require combining different channels to maximize gross sales in order to sell everything when it is ready.

According to Muriuki et' al,(2003), asserts that dairy farmers prefer those channels that take milk from farmers in large quantities. Muriuki, acknowledges that dairy farmers options for channels that absorb or take their produce (milk) in large quantities throughout the production season. Farmers also prefer those channels where the rejection rate of the commodity delivered by the farmer is very low if any. According to FAO a report (2005), dairy farmers both small scale and large scale choose distribution channels that collect milk in large quantities without pegging this on the price the milk is going to fetch.

This phenomenon according to the report is common in areas where forage availability for dairy cows does not fluctuate, for example in Nyandarua, Kericho, and Kisii. This is because of farmers over production of milk and under consumption of the commodity, inaccessibility to the market during the rainy season due to poor infrastructure, inefficient transportation of raw milk and poor access to dairy markets. Weimer (2012), found out that farmers do not actually evaluate

the type of channel to use whether formal or informal markets. The author further asserts that farmers will go for those channels that absorb milk in large quantities for fear of losing the commodity due to its high perish ability levels and sensitivity in handling.

2.2. Common challenges and constraints of dairy production and marketing

Dairy development in Africa has been hindered by marketing constraints including poor access to markets in rural areas, low availability of products absence of a structural marketing system International development Research center (IDRC), 1984), and unattractive prices to producers where structured marketing does exist.

Marketing problems occur in the study area mainly during fasting and the rainy season. About 55.9% of the respondents reported that there is less demand for dairy products during fasting time, while 44.1% of the respondents reported the rainy season as a marketing problem due to the increase in milk production and the concomitant decrease in price of dairy products. The majority of people living in this region are followers of Orthodox Christian faith and thus do not consume dairy products especially during the Easter fasting period (55 days) (Eyassu and Asaminew, 2014). Overall, Orthodox Christians are abstained from dairy products for about 200 days per year (Ahmed *et al.*, 2004).

There are a number of constraints on the milk supply side, especially the relatively high milk production and collection costs and the inadequate quality of raw milk. Poor milk quality limits the volumes of processed products that processors can supply, especially for value-added products such as milk powder, sour milk, cheese and yogurt. The loss of milk due to spoilage is also cited as a major risk for all stakeholders in the dairy supply chain, with impacts on income loss, supply disruptions, etc. (Bingi and Tondel, 2015).

As Gebrewold et al. (2000) also argue that the past poor performance of Ethiopia's dairy sector has been attributed to socio-economic, infrastructure and technical constraints, inadequate research and extension in livestock compared to crop and lack of direction and scope of policies related to dairy. The most common constraints noted are land tenure policies, feed availability, breeds of cattle used and lack of animal services, marketing outlets, roads and transportation.

2.3. Experiences of Dairy Marketing Systems in Some Selected Countries

The entire dairy value chain has to be profitable to ensure sustainability, including profitability for the small dairy farmer in Bangladesh. The work to achieve profitability among the small dairy farmers commences at an early stage during the start-up of the dairy hub. Profitability for these dairy farmers is achieved gradually and improved feeding and nutritional management is one of the first steps (Sayef & Bjorn, 2012). With improved feeding and nutritional management, milk yields and profitability increase. The objective is for all small dairy farmers forming part of a dairy hub to achieve a production level where dairy farming becomes their primary source of income (Sayef& Bjorn, 2012).

In 1980s, with the abolishment of planned purchase and marketing from northwest China into the market of middle and coastal areas of China, the arbitrary restrictions in dairy products circulation have been canceled. Thus, dairy products could be distributed freely in different areas according to market laws (Dinghuan Hu etc., 2004). However, except the changes in system, it is also necessary to solve the long-term freshness retaining of dairy products, especially of liquid milk, through technical approaches, to achieve free circulation of dairy products in different areas. China is vast in territory, and traditional pasteurized milk could not be transported from one place to another (Dinghuan Hu etc., 2004). Western Region of China is superior in the supply quantity and purchase price of raw milk, but the key problem is how to transport liquid milk to other two regions. The preserve period of traditional pasteurized milk is too short to be suitable for long-term transportation. The Ultra High Temperature (UHT) milk appeared in 1961 to solve the above problem (Li Tong, 2008).

Dairy production is a critical issue in Ethiopia, a livestock-based society where livestock and its products are more important sources of food and income, and dairying has not been fully exploited and promoted (Belete, 2006). The greatest potential for new technologies in dairying is expected in the highlands of Ethiopia and other sub-Saharan Africa and Asian countries, due to low disease pressure and good agro- climatic conditions for the cultivation of feed. High population densities and animal stocking rates, as well as easy access to markets, make it attractive to invest in market-oriented dairy production technologies in Peri-urban areas in these regions (Tangka*et.al*, 2002).

2.4. Historical Perspective of dairy development in Ethiopia

Political developments in Ethiopia coincide with three phases of dairy development policy and regulatory frameworks: (1) imperial regime (1950-1974) characterized by a free market economic system and the emergence of modern commercial dairying, (2) the socialist *Derg* regime (1974-1991) that emphasized central economic system and state farms and (3) the current phase (1991 to present) under the structural adjustment program and market liberalization (SNV, 2008).

I - The Imperial Regime (1950–74)

The first attempt to introduce modern dairy production in the country was made by the Imperial Government in 1947, when 300 Friesian and Brown Swiss dairy cattle were received as a donation from the United Nations Relief and Rehabilitation Administration. A small milk processing plant was established in Shola, just outside Addis Ababa, to support commercial dairy production (Yigezu 2000). Later missionaries and some foreign individuals and organizations also introduced small numbers of imported exotic dairy cattle. Between 1959 and 1969, with additional support from the UNICEF, several successive steps were taken to meet increased urban demand for milk.

These included: expansion of the capacity of the Shola plant, first to10, 000 liters per day and later to 30,000 liters; to supply the processing plant, opening of milk purchasing and collection centers throughout Addis Ababa, and later up to a radius of 70 km around Addis Ababa along main roads; and limited extension service and incentives to well-off farmers to take up commercial dairy production to supply the milk collection points (Staal 1995).

II - The Socialist Regime (1974–91)

Under the Socialist Regime (1974-1991), the Dairy Development Agency (DDA) was created as an autonomous body to provide guidance and assistance; for example provision of extension and credit to farmers to establish commercial dairy farms in areas serving the cities and town ships and improve the quality and increase the quantity of milk and milk products (Ketema, 2000; Yigezu, 2000). Under this scheme, 30 medium-sized farms (40 milking cows each) were established with imported exotic cattle, 885 grade and cross-bred in-calf heifers were distribution

to medium- and small-scale farms and 13 new milk collection centers were constructed and renovated. With the encouragement of the DDA, co-operatives came into existence to undertake commercial agricultural production, including dairy, although co-operatives did not engage in milk collection at that time. Co-op members were those with larger landholdings for dairy production purposes (Alemayehu, 1992).

In 1990, in view of the world's economic prospects, the *Derg* Regime revised its policies and adopted a mixed economy. Due to the failure of socialized agriculture, producer co-operatives were reorganized by giving them the opportunity to act in a democratic manner and decide their own destinies: 95% of producer co-operatives disintegrated within three months of this announcement (Alemayehu 1992). Collective property was either divided between members or sold; in this way a large number of cross-bred dairy cattle came into the hands of small-scale private producers in urban areas (Gizaw and Amare 1992). The Dairy Rehabilitation and Development Pro gramme and the extension pro gramme then had to revise their pro grammes to serve individually owned dairy farms which kept one or two cows rather than the cooperatives (Ketema 2000; MoA 1994).

III - The current regime – Market led economy (1991–present)

The third phase in the history of the dairy sector in Ethiopia starts from the year 1991, when The Ethiopian People Revolutionary Democratic Party came to power. Several macro-economic reforms were made from the very beginning of this phase. The fixed exchange rate which has been 2.7Birr for 1 USD was d evaluated to about 5Birr with subsequent small devaluation and periodic changes based on the interbank foreign currency transactions. This rate in September 2009 was at about 12.5Birr for 1 USD (UNIDO, 2009).

Although land remained in the hands of the government, the new constitution, drawn up in 1994, allows temporary leases. In addition to these major policy reforms, the new federal government launched a new national development strategy namely, Agricultural Development-Led Industrialization (Woldemichael, 2008). The national strategy seeks to bring about an improvement in the livestock sector by enhancing the quality and quantity of feed, providing improved animal feed and improved extension services, increasing livestock health services and

improving productivity of local cows by artificial insemination while preserving the indigenous breeds (Benin et al., 2002; cited in Mohamed et al., 2004).

In Ethiopia in 1991/93 and 1994, 595 million and 577 million tons of meat, respectively, have been produced. In addition to this due to the export of the 3,790 bovine live cattle in three years (1990-1992) a total value of 1,493 million US $ foreign currency has been gained. In these years the country imported 8 tons of concentrated milk so as to satisfy the milk demand of the population (ILRI, 2000).

2.5. The Current Status of Dairy Production and Dairy Marketing benefits in Ethiopia

2.5.1. The Current Status of Dairy Production Systems in Ethiopia

Dairying is practiced almost all over Ethiopia involving a vast number of small or medium or large-sized, subsistence or market-oriented farms. Based on climate, land holdings and integration with crop production as criterion, dairy production systems are recognized in Ethiopia; namely the rural dairy system which is part of the subsistence farming system includes pastorals, agro- pastorals, and mixed crop–livestock producers and the Peri-urban; and urban dairy systems(Sintayehu et al., 2008). The first system (pastoral-ism, agro- pastoral-ism and highland mixed small holder production system) were found to contribute to 98%, while the Peri-urban and urban dairy farms produce only 2% of the total milk production of the country (Sintayehu et al., 2008).

According to Mulugeta and Belayeneh (2013), the overall average estimated lactation length of both local and cross bred cows was 10.49 ± 3.08 months, of which local cows were 9.13 ± 2.63 months. The lactation length of Holstein Friesian local cows crossbred of unknown blood level was 11.13 ± 4.84 months. The overall average estimated daily milk yield of local and cross bred dairy cows was 3.75 ± 3.25 L and for local cows was 1.67 ± 0.41 L. The average daily yield of crossbred dairy cows was 4.73 ± 3.2 L. The Ethiopian Central Statistics Agency (CSA, 2012) estimated that 3.33 billion liters of cow milk was produced with an average daily production of 1.54 liters per cow. Eighty three percent (83%) of the milk produced came from cattle while the balance coming from goats, camels and sheep.

The highland small holder milk production is found in the central part of Ethiopia where dairying is nearly always part of the subsistence, small holder mixed crop and livestock farming. Local animals raised in this system generally have low performance with average age at first calving of 53 months, average calving intervals of 25 months and average lactation yield of 524 liters (Zegeye 2003).

Peri-urban milk production is developed in areas where the population density is high and agricultural land is shrinking due to urbanization around big cities like Addis Ababa. It possesses animal types ranging from 50% crosses to high grade Friesian in small to medium-sized farms. The Peri-urban milk system includes small holder and commercial dairy farmers in the proximity of Addis Ababa and other regional towns. This sector owns most of the country's improved dairy stock (Tsehay, 2001). The main source of feed is both home produced or purchased hay; and the primary objective is to get additional cash income from milk sale.

2.5.2. The Current Status of Dairy Marketing benefits

The average price of fresh liquid milk in Peri-urban and urban (Chacha) town was 6 Birr/L and butter was sold 110Birr/kg and there was no trend of selling cheese in Angolellanatera (chacha). In rural areas, butter was the dominant marketed dairy commodity and may be due to absence of milk collection centers and traditional beliefs (Mulugeta and Belayeneh, 2013).

Butter is sold in rural markets and at the central, public butter market in Addis Ababa. In rural markets the butter is sold by volume, the weight of which can vary considerably. In Addis Ababa market butter is sold by weight. The moisture content varied from 2 to 43%, most samples having less than 16% moisture. The content of free fatty acids in the butter sold in rural markets varied from 0.23 to 1.20%. Older butter sold in the Addis Ababa market had free fatty acids content of as high as 23% (Ephraim and Tarik, 1987). The retail price in Addis Ababa market for butter fluctuates depending on its quality and onmarket demand, which is high at Easter and during other feasts but low during the fasting periods prescribed by the Coptic Church. A 10% increase in butterfat recovery could be expected to increase income by about 5.00Birr ($ 2.5) per 100litters of whole milk processed (Ephraim and Tarik, 1987).

According to Belete (2010) reported, out of the total butter produced, about 25% is consumed and used for cosmetics at the household level and the remaining is marketed. About 85% of the women also sell butter immediately to the market.

In the rural markets of Fogera, the price of butter fluctuates depending on the season, and ranges from ETB 20/kg in the wet season to about ETB 28 in the dry season. Retail prices range from ETB 22 to 30 depending on quality and market demand. Butter price is highest around Easter and other festivals and lowest during the fasting period by the followers of the Ethiopian Orthodox Church (Belete et' al., 2010).

Performance of the market is commonly measured in terms of productive and allocative efficiency. Progressiveness or innovation is also sometimes considered. Where equity and employment creation are national objectives, these are also considered as criteria for performance assessment (Marion and Mueller, 1983). Productive efficiency usually calculated at the firm or enterprise level, is the combined result of technical and operational efficiency. Technical efficiency is measured in terms of physical input: output ratios. Theoretically, technical efficiency may be measured as the ratio of actual output to potential maximum output per unit of input, given technology, location and environmental conditions. In practice, technical efficiency is measured in relative terms by comparing differences in input-output ratios of firms with similar resources. Operational efficiency, also referred to as firm level allocate or price efficiency, is defined as the level of output at which the value of marginal product equals marginal factor cost for each factor of production or marketing. This is also the profit maximizing level of output.

Allocate efficiency, also referred to as pricing or economic efficiency, is usually measured at the market level. A market is considered economically efficient if (a) all enterprises in the market are productively efficient, (b) the distribution of enterprises, plants and infrastructure are organized in a manner which enables scale and location economies to be exploited, (c) prices provide incentives to producers and consumers that are consistent with available resources and demand.

Economic efficiency is achieved when the sum of consumers' and producers' surplus is the maximum, and when Pareto optimality prevail that is, no change in the economy or market can be made whereby an individual can be made better off without reducing the welfare of another individual. It is assumed that competitive market maximizes the efficiency of resource allocation (French, 1977).

The most important hypothesis generated by the structure - conduct - performance school of thought, and tested by a wide range of marketing economists, is that as market or industry structure moves away from perfect competition, output and allocative efficiency will decrease and prices will rise.

2.6. Dairy marketing channels and outlets

In Kenya, informal milk outlets are shown to absorb most of the milk from small holder farmers accounting for over 80% of the total milk sold. Brokers, traders/hawkers, transporters, co-operatives and farmer groups are identified as the most important participants at the rural markets. The farm gate milk prices in informal markets are 22% higher than in the formal marketing channel. Cooperatives remain the main channel for collecting milk destined to the formal market. Analyses of marketing margins indicate that players in informal market have lower marketing margins as compared to the formal channel (Belete, 2006). Butter was the most marketable dairy derivative having the longest market channel and more intermediates between producers and consumers, while sour buttermilk had few intermediates and reached consumers with the shortest channel (Sintayehu et al 2008).

Sintayehu et al (2008) reported that the major dairy marketing system found in the studied areas was informal marketing; milk was sold mainly on contract basis to customers. However, cooperatives/producer groups were trying to fix price for milk collection in Shashemene, Awassa, and Yirgalem towns based on organoleptic qualities of milk.

Dairy producers are the ones who fix price of milk and other dairy products when selling their product to consumers and through negotiated prices when selling to traders. The government does not substantially intervene, in any way, be it through regulation or trade of dairy products in the area (Sintayehu et al., 2008).

In Ethiopia, in the town areas where there is a good demand for fresh milk the surplus can readily are sold. In the Addis Ababa area there is organized milk collecting system 120 km along the roads leading to the capital. In the rural areas far away from the main roads the possibility of selling fresh milk are more limited. In addition to this, the members of Ethiopian Orthodox Church abstain from consuming milk and animal products about 150 days per year during the fasting periods. The surplus milk has thus to be converted in to butter and cottage cheese (Ayib). These products are usually sold at the markets (Debrah and Birhanu, 1991).

Dairy producers in the Addis Ababa milk shed have available a variety of milk outlets for their production. A substantial amount of the milk marketed by producers, some75% goes through informal channels; defined here as those channels which avoid taxation and quality controls. These include direct sale to individuals, sales to institutions, sales to private milk traders, to retail outlets, and to informal dairy processors. But the only formal outlet for liquid milk the Dairy Development Enterprise which operates a system of milk collection and cooling centers along the major roads radiating from the capital (Staal and Shapiro, 2000).

2.7. Conceptual Framework

A Conceptual Framework for Dairy marketing chain as a simplistic description of the beginning and end points of the dairy marketing chain development process is the ‘traditional model’ (also known as the small-scale subsistence or Southern tropical model) to reflect the small-scale, farm-household milk production and informal market systems that predominate in most developing countries. Characteristics of ‘traditional’ milk production systems include:

- multi-objective household model of farmer behavior
- low levels of inputs and outputs
- nutrient deficit in both farm and household

Characteristics of ‘traditional’ milk marketing systems include:

- diffuse market structure, consisting of many small-scale market agents
- artisan processing, labor-intensive handling and transport methods
- low-cost products, mostly liquid and limited in diversity
- great diversity in market behavior and roles
- no voice or role in dairy policy making

The conceptual framework poses a number of factors that drive this shift. These include:

Demand levels and consumption patterns, which are closely associated with income growth and urbanization and with local consumption traditions. Milk is not a commodity but rather a complex set of products, the demand for which is determined by:

- increased demand for quality, food safety and standardization
- changes in consumption habits and lifestyles
- demand for convenience
- changes in levels of demand

Opportunity costs of labor and land are also key driving forces for system change, which tend to bring about a substitution of capital for both of these factors and a general shift towards commercial systems. Aspects of this include:

- opportunity costs of labor in milk production
- opportunity costs of labor in milk markets
- opportunity costs of land

Market access, infrastructure and institutional development condition the structure and performance of production systems for a highly perishable product. Elements of these described in the report include:

- transaction costs and infrastructure
- transactions costs and institutions
- transaction costs and location of production

Technology and policy interventions can alter the opportunities and incentives for dairy system change and development. Generally, improved technology will reduce costs and induce shifts towards more commercial systems; adapting to changes in other factors will be dependent on the availability of technological alternatives, either existing or new. Policies - deliberate or inadvertent - for market regulation and infrastructure investment can alter market institutions and transactions costs. Critically, policies can partially determine the winners and losers of structural changes in the sector determine market participation of smallholders versus larger producers and employment generation and incomes at both farm and market level.

International livestock center for Africa has confirmed that there is a good understanding of factors affecting milk supply response in sub-Saharan African countries.

These factors are generic; they apply to dairy farmers anywhere and include (ILCA, 1990):

1. Farm-level prices
2. Risk and uncertainty:
3. Cost of inputs (labor, feed, fixed assets)
4. Opportunity costs and
5. Technology.

But while we understand the factors that influence supply and the direction of their influence, there has been little rigorous quantitative analysis of how farmers respond to these factors. Studies of agricultural marketing in Africa have generally found that farmers have a choice of outlets and that traders were reasonably competitive so that marketing margins reflected costs and not excessive profits. This seems to be the case for the informal and private dairy marketing channels. However, in many of the formal channels, margins fail to cover costs. The main problems for efficient dairy marketing in the informal sector of SSA (ILCA, 1990) are:

- the small quantities supplied per farmer due to their status of cows
- seasonal fluctuations in supplies due to animals fodder
- poor and seasonally impassable roads and the distance
- availability of transport, technology like extension services and
- Low level of education about collection and preservation of quality milk.

The analysis in the previous studies suggests that both economic and non-economic factors are potentially important in explaining the demand for dairy products. In addition to socio-demographic factors such as ethnic origin, geographical location and family size and composition, economic factors such as incomes and prices may also affect dairy product demand. Consumers' preferences for dairy products were also elicited by asking them to indicate one preferred product out of each of three different groups of dairy products: milk-type products, butter-like products and dairy snacks which determine dairy demands accordingly, (Woldemichael, 2008).

The Netherlands Development Organization (SNV, 2012) the determinant factors of dairy farming stating as the majority of the members are male Guruve (92.5%) and Dowa (69.4%).

The majority of the members are married.

Literacy levels are high with only Guruve (2.6%) reporting cases of members with no formal education. This has a bearing on training as members with no formal education are not able to read and write.

The majority of the farmers are not formally employed with some formally employed Dowa (17.5%) and Guruve. Guruve (48.6%) and Dowa (40%), have the high numbers of farmers with no formal training in agriculture. This has a negative effect in farmer understanding of farming as a business and the comprehension of technical issues.

The average household size is five (5) for Dowa and seven (7) for Guruve and of these Dowa (3) and Guruve (2) are used as family labor.

The average age of the household is fifty three (53) years for Guruve and fifty six (56) for Dowa.

The relative dairy experience stands at Dowa (11 years) and Guruve (10.8 years). The dairy herd size is four (4) for Dowa and five (5) for Guruve.

The Distance to the MCC averages six point six (6.6) kilometers for Dowa and eleven (11) for Guruve. The distance for Guruve however, does not take into consideration the fact that the sub-collection point at Karoe farm (The A1 resettlement) is thirty five kilometers to the main Milk Collection Center (MCC), (SNV, 2012).

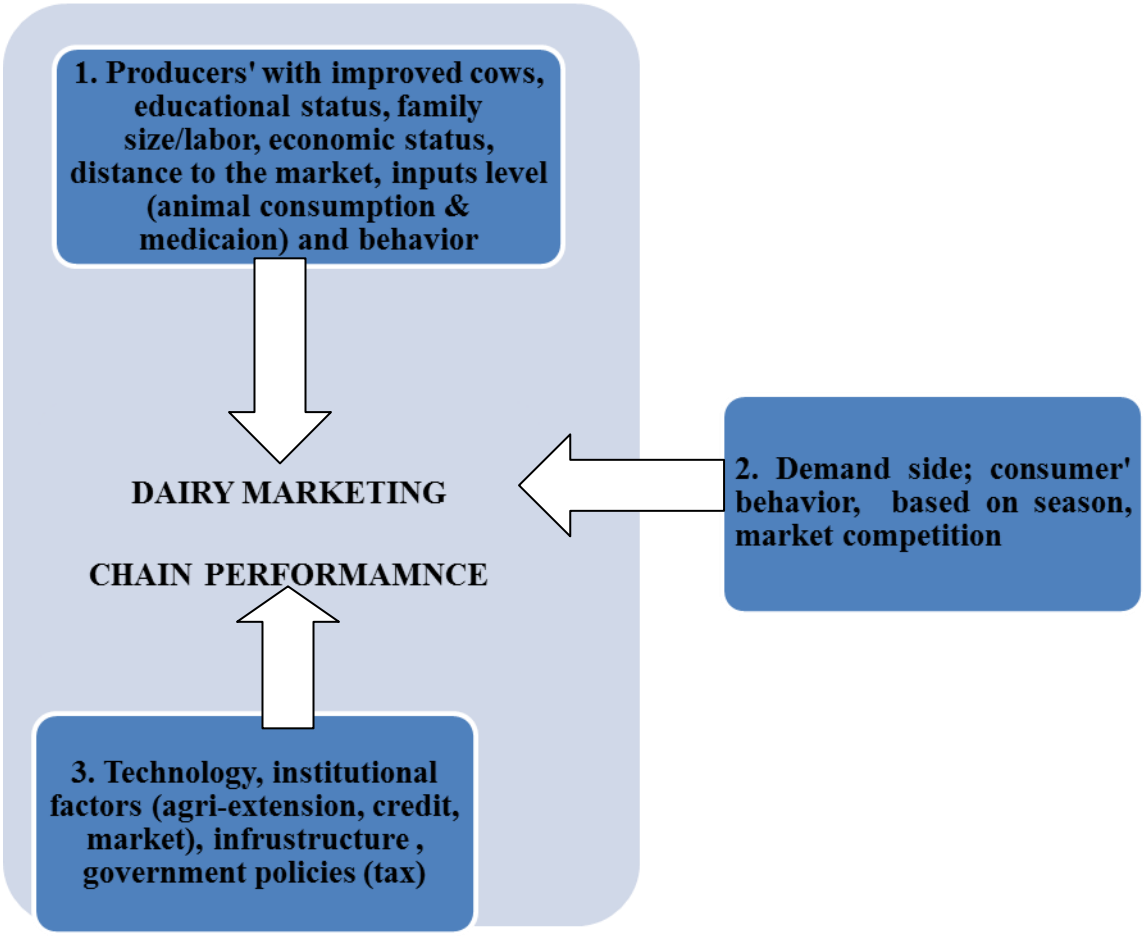

Fig. 1.Conceptual framework of dairy marketing Source: own elaboration based on different literature reviews (2016/17).

CHAPTER THREE

RESEARCH METHODOLOGY

3.1. Description of the Study Area

The study were conducted at Gondar, the capital city of North Gondar administrative zone of Amhara regional state, which is located 710km North West of Addis Ababa (Figure 1). The study area has an altitude ranges from 1850 to 2990 m.a.s.l and is predominantly classified as *Woina dega agro*- ecology. The minimum and maximum temperature averages experiences 8.9^{o}c and 26^{o}c, respectively. The average relative humidity has 58 % (Anteneh et al, 2012). There are 11 rural *kebeles* and 12 *Kifle-Ketma* administrative in Gondar town. The total human population of the district was 300,529, of which 109,717 was rural population.

Based on existing digital data, mean annual rainfall 1216.3 mm and ranging from 1103 to 1336 mm. Spring (*Belg)* and Summer (*Kiremt)* are two cropping seasons, with short and long rainy periods. *Belg* rain (March to May) has important factors for the re-growth of grasses, shrubs and some indigenous trees and supplements livestock feed. *Kiremt* (long rainy season) is used as the only cropping season where all crop and grass types are grown and the land is covered by vegetation, except a few of urban infrastructure sites.

Gondar town is found in Lake Tana watershed and there are three major rivers; *Azezo-Shinta*, *Keha*, *Megech-Angereb* that are added to Lake Tana, which are of great economic importance to the *district*. These rivers are mainly used for Tap water Project (*Angereb*), cattle feeds and irrigation during the dry season for the production of horticultural crops, mainly vegetables. The total land area of Gondar special administration zone is 79 ha (GIS version 10).

Gondar special administration zone is one of the surplus producing areas growing diverse annual and perennial crops such as cereals (*Teff*, maize, millet), pulses (chick pea, lentil, bean, maize), oil crops (*noug*, linseed), vegetables (onion, pepper, tomatoes), and fruits (papaya).

According to Gondar animal agricultural office report (2014), the major local livestock resources are cattle (87,128), goats (17,867), sheep (7607), chicken (246,496), beehives (883), donkey (13,189), mule (72) and horse (378). Improved (cross) breeds include heifer (96), young bull (29), cow (453), and calf (3).

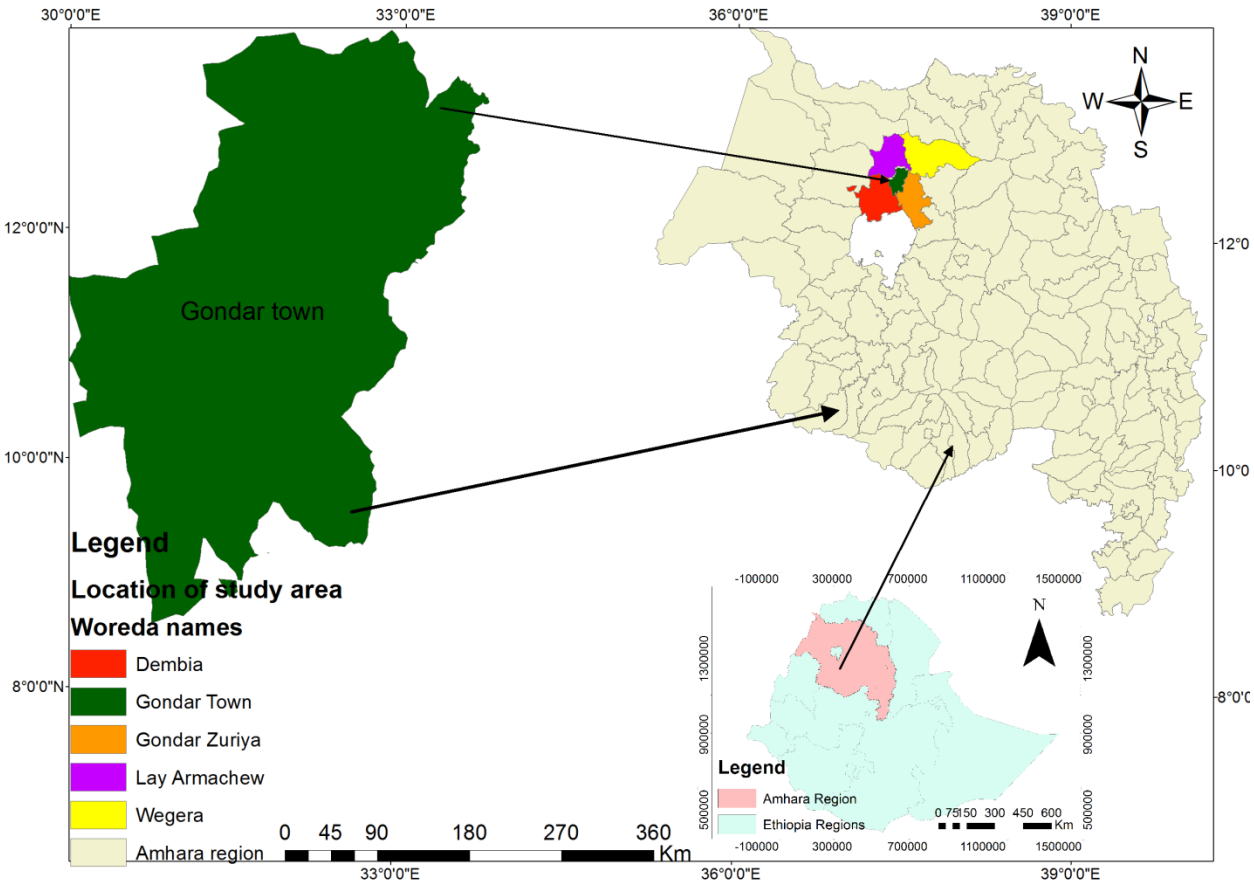

Figure 3.1 Location map of the study area. Source: GIS data base system, version 10.

3.2. Research methodology

3.2.1. Research approach

In this research, a mixed methods approach was used. A mixed methods strategy is one that uses both qualitative and quantitative methods. As an approach, with a recognized name and research credibility, it has only come to in recent years championed by writers such as Creswell (2003), Creswell and Plano Clark (2007), and (Greene *et al.,* 1989). Because a mixed methods approach improved accuracy: In line with the principles of triangulation, the mixed methods approach provides the researcher with the opportunity to check the findings from one method against the findings from different methods (Greene *etal.,* 1989). It can be a valuable research strategy for the validation of findings in terms of their accuracy, checking for bias in research methods and the development of research instruments.

Therefore, in this research a combination of approaches; qualitative and quantitative methods of collecting and presenting have employed. Integrating the two forms of data approaches provides a more complete picture, developing the analysis and understanding of a research problem to capture relevant empirical observations and measurements or a multiple interpretive of the holistic perspective of the household and environment.

3.2.2. Research design

The research design employed in this study was descriptive and explanatory research method. In this descriptive study, qualitative and quantitative data collection techniques was used, including; structure questionnaires, focus group interviews, semi-structured interviews, the researcher's field notes of personal observations and conversations and analyses of secondary data. Additionally, to provide a more complete and multidimensional understanding of the issues, a triangulation methodology design was employed (Morse &Niehaus, 2009).

To acquire different perspectives and draw attention to analyze dairy marketing chain in the study area, descriptive research method was employed in this study. According to Johnson and Turner (2003), descriptive methods are used when the researcher seeks to "describe, observe, and document a naturally occurring phenomenon which cannot readily be ascribed an objective value". Depending on what is to be described, descriptive research can be very concrete or more abstract (Bryman, 2006). At a concrete level, data collected is often strongly quantitative in nature (Blaikie, (2003)). In this study, data was collected in the form of participant demographics, monitoring of implementation tools, and questionnaires. In addition, more abstract descriptive research, in the form of stakeholder interviews, FGDS, observations were also included. According to Jick TD (1983), qualitative descriptive approaches are extremely helpful because evidence of experience and knowledge can be easily missed when quantitative methods are used. According to Bryman (2006), qualitative interviews attempt to "make meanings" from individual accounts and experiences.

In this regard a range of triangulation methods was utilized in this study as it involves the application and combination of several research methodologies in one study (Bamberger, 2012). There are four common types of triangulation discussed within the literature. These are: methodological triangulation that involves using more than one methodological strategy of combining qualitative and quantitative data during data collection; data triangulation that involves time, space and persons; investigator triangulation which uses multiple observers and unit of analysis triangulation that involves the use of different qualitative techniques or different families of statistical tests (mean, t-test, Chi-square, percentage, etc) helps to verify results (Bamberger, 2012). According to Jick TD (1983) the use of multiple data sources and methods are used to cross-check and validate findings and enhance the depth and quality of the results.

3.2.3. Sampling techniques and procedure

Consultations were made with the livestock experts of the district to select *Kebele* Administrations and villages within each *Kebele* Administrations. Accordingly the district (*Woreda)* bulletin (2007), agricultural sector growth and development strategy of livestock and dairy production job processing coordinator, there were four known associations that they support technically for the farmers in the *woreda* and one dairy cooperative marketing center. Namely, *Loza Mariyam Akababy* dairy producer *Yehibret Sira Mahber* (male 30, female 18), *Lamie B*ora *Arbiba* and *Tadele Dibabaw* dairy plant marketing *Yehibret Sira Mahiber* (male 63, female 18), *Tagleh Edeg Azezo* and *Akababy* animal production and dairy selling *Mahiber* (male 20, female 1) and *Azezo* and *Akababiew* dairy production plant marketing *Yehibret Sira Mahiber* (male 41, female 20) and *Fasil* dairy cooperative marketing center. Totally, there were 211 (male 154, female 57) dairy producers that have supplied for Gondar town. The purpose of making associations have gotten technical support from the agricultural officers and to learn experiences among themselves to scaling up their quality of dairy production and the way of conducting a market of their dairy production. Thereby, each dairy producer has supplied milk and milk products and sells for the consumers and retailers as *Woreda* livestock and dairy production job processing coordinator announced. All these are found in the town of Gondar and the surrounding rural *Kebels* which was selected purposively to be study.

Respondents for the study were milk and butter producers, buyers and key informants. Milk and butter buyers include cooperatives, traders and consumers. During the census, breed type (local, cross and exotic) and herd sizes was recorded for all households owning dairy farm. The technique used to classify dairy farm categories and herd size by Anthony *et al.* (2004) into three size categories was adopted to categorize exotic, cross breed and local breed dairy farms in this study.

3.2.4. Population Sample size determination

Total numbers of households in the study area was listed from each association which was obtained from the *Woreda* livestock and dairy production job processing coordination office. Therefore, the total number of dairy producers from each association was 211 (male 154, female 57). And there were 2307 (male 1836, female 471) café workers and 1192(male 1009, female 183) bar and restaurants in Gondar town as data obtained from the cultural and tourism bulletin (2008). Thus, the sampling population of retailers was drawn from a total of 3700 (male 1836, female 471) household heads in the study area. Therefore to determine sample size of respondents those to participate in the study sample technique, which was developed by Cochran (1977), was applied with *p* value of 90% and confidence level of 95%. Thus, *n* value estimated using:

$$n = \frac{Nz^2pQ}{D^2(N-1)+z^2pQ}$$

Where: *n* is sample size; *z* is value of standard variant from normal curve; *p* is estimated population proportion; *q* is 1-*p*; and *e* is error term (5%). Even though *p* value of 50% could give highest sample size, it was limited to 90% due to resource constraints and consistency observed during the pilot study. $n = \frac{3700(1.96)^2(0.9)(0.1)}{(0.05)^2(3700-1)+(1.96)^2(0.9)(0.1)}$ $n = \frac{1279}{9.6} = \mathbf{134}$

Table. 3.1. Proportional sample size distribution of household heads in the study area.

No	Category	Total population			Sample population		
		M	F	T	M	F	T
1	LozaMariyamAkababy dairy production	30	18	48	10	6	16
2	Lamie Bora and Arbibadairy plant	63	18	81	16	6	22
3	TaglehEdegAzezo and Akababydairy production	20	1	21	7	-	7
4	Azezo and Akababiewa association	41	20	61	15	7	22
5	Café	1836	471	2307	37	9	46
6	Bar and restaurants	1009	183	1192	20	1	21
Total		**2989**	**711**	**3700**	**105**	**29**	**134**

Source: own survey (2016).

Accordingly, the dairy producer respondent sample size was determined to be **134**. From this sample size determination, *Fasil* dairy marketing cooperative, 7 key informants from each category purposively selected. Finally, 50% of milk and butter producers and an equal percentage of retailers of café, bar and restaurants was selected from 134 sample population using probability proportional to random sampling. The rational reason of taking proportional sample size of a 50% of producers to a 50% of traders was, because of the larger sample size probably was occur on retailer household heads (since they are larger in size), and the targeted household group of producers might be share very fewer sample size and leads to a probability of collecting a limited data in the supplied side of dairy products which again likely to capture inadequate data to explore the already stated objectives.

3.2.5. Data sources and Methods of data collection techniques

3.2.5.1. Data sources

In this study, both the primary and secondary data was employed.

Primary data sources: are data that are gathered from milk and milk product producers, traders and users by direct contacting through questionnaire interview and group discussion data collection tools. Since the primary sources have the advantage of providing detail information, high accuracy and understandable units in which the data are recorded as a result the researcher have relied on the primary data. Primary sources are more closely related with the problem under study.

Secondary data sources: secondary data sources are used to substantiate primary data. These data was extracted from Gondar town Agricultural and Rural Development offices and from other sources, such as government reports, journals, published and unpublished research works.

3.2.5.2. Methods of data collection techniques

A range of data collection techniques which was used in this study presented below.

Questionnaire: Structured questionnaires used for collecting quantitative and qualitative data from selected sample households to the study. The household survey covered demographic characteristics, household socioeconomic factors, costs and profits of milk and butter was analyzed. To this study, questionnaire has many advantages; it provides standardized questions to respondent, it allows respondents to consult or refer documents. In turn some close-ended questions also consolidated by open-ended questions to root out the basic causes of different perspectives that emphasize particular dimensions to insight people's activities and perceptions.

Interviews: Semi-structured interviews were made as method of primary data collection with part of questionnaire to gather sufficient and relevant data from respondents. Because of questionnaire method of data collection alone has some drawbacks like high no response rate, it is not methodologically advisable in collecting data from illiterate respondents and it may not yield accurate and reliable information as some words create confusion plus enumerators role limitation. Individuals and the institution that was considered knowledgeable and rich in experiences about dairy marketing chain activities and socio-economic condition of the community in the study area identified and interviewed individually. Moreover, the researcher's personal observation of the site helped him to understand the over-all process of dairy marketing chain development and crosscheck data gathered through household survey and key informant interview.

Focus group discussions: in order to accomplish the objective of this study focus group discussion was employed by the researcher. A focus group discussion "…is invariably interested in the ways in which individuals discuss certain issues as a group, rather than simply as individuals" (Alemtsehay, 2010). Therefore, to this investigation focus group discussion was conducted with different key informants like senior dairy producers and retailers and dairy committee leaders, elders, women's, and youngster.

This method of data gathering especially used to gather data's having qualitative nature and it was conducted with definite time intervals. Eight dairy farmers and eight retailers (one group from each cluster*)* were selected.

Questionnaire Validation and reliability: A pilot test was evaluated, which was performed with 16 (8 producers and 8 retailers) participants in October 2016 to examine content validity of the preliminary questionnaire in regard to factors such as relevance and clarity of language. After this test, the researcher made minor revisions and finalized the initial version of the questionnaire. The questionnaire was constructed with two domains, one in the supply side of the dairy production activities and the other was the demand side of retailers and consumers. The mean age of the dairy producers was 47.4 years (range: 33–68), and 2 of the participants were female (37.5%). The mean age of the dairy traders was 43.8 years (range: 33–52), and 3 of the participants were female (25%). A questionnaire was translated in to a language understood by the target population. The mean time required to answer all the questions was 9.7 minutes (range: 7–14). The question items were considered to be easily understandable because when surveyed, the participants did not make any particular comments.

To be reliable the questionnaire must first be valid. Reliability is basically the ability of the questionnaire to produce the same results under the same conditions. Having looked at the factor structure, the researcher need to check the reliability of the items and the questionnaire as a whole. The most commonly used technique to estimate reliability is with a measure of association, the correlation coefficient, often termed reliability coefficient (Rosnow and Rosenthal, 1991). The reliability coefficient is the correlation between two or more variables (here tests, items, or raters) which measure the same thing. First using the split-half method randomly splits the questionnaire items into two groups.

A correlation score for each item is then calculated based on each half of the scale and their average correlation between the items computed as 0.62. Finally, by using Cronbach's alpha method, which is the most common measure of scale reliability is used. When items have equal variance (e.g. after a z-transformation) the Cronbach's alpha measure becomes:

$$@ = \frac{(N\bar{r})}{(1)+(N-1)\bar{r}}$$

$$@ = \frac{\left(\frac{34X0.62}{1+33X0.62}\right)}{} = 0.98$$

Whereby N is the number of items and r the average correlation between the items. The Cronbach's alpha for the thirty four ease-of-use dimension items is 0.98. This is a high value. Criteria of acceptable levels of alpha qualify a value of 0.8 and higher as good, and above 0.7 as satisfactory (Loewenthal, 2001). Our alpha value is therefore greater than the acceptable value (0.98), as a result our questionnaire is valid and reliable.

3.2.6. Methods of data analysis

After the data collection, the data was coded and entered to the statistical package for social science version 20 (SPSS version 20). Both qualitative and quantitative assessment tools were used for data analysis. For data having qualitative natures was analyzed in verbal expressions, while those quantitative data was employed on tabular, percentage, mean, standard deviation, chi-square and T-test analyzed to ascertain relationship among variables. The statistical significance of the variables was tested for both dummy and continuous variables using chi-square and F-tests, respective.

3.2.7. Model specification

Dependent variable

In this study, the principal dependent variables are milk and butter producers and retailers.

The independent variables were presented below with their respective hypotheses.

Age of a household head: Age is a continuous variable and measured in years. In Ethiopia, household head is the decision maker for farm activities. Age is one of the factors that determine decision making of a person. Advanced aged household heads are more willingness to accept

new technology and dairy production styles than younger household heads. Thus, age of household head is hypothesized to have positive contribution to dairy marketing channels.

Family size of a household in adult equivalent: Households with large family size in adult equivalent have more labor for dairy production. Family size in adult equivalent is correlated positively affect dairy productivity and marketing.

Education (literacy) level of a household head: Education has paramount impact on dairy production and marketing and income improvement. It is likely that educated farmers would more readily adopt dairy technologies and may be easier to train through extension support.

The number of livestock owned: This is a continuous variable. The number of households with higher livestock holding will lead to higher probability of getting excess milk and butter as well as livestock for selling and hence generating additional income.

Experience: is a continuous variable and positively affects the dairy marketing if the household has long experience and other wise.

The regression model

The relationship between the dependent and independent variables in this case could be best represented by multiple regressions.

$$\mathbf{Y = B_0+B_1X_1+B_2X_2+\ldots+BnXn} \quad \textbf{(1)}$$

Where, $X_1\ X_2 \ldots\ Xn$ are explanatory variables. B_0- is the intercept, B_1, B_2 … Bn are the regression parameters (slopes) of the equation in the model and Y is the dependent variables (dairy farm marketing of producers and retailers).

Before model analysis was commenced, to check the problem of multicollinearity the Variance Inflation Factor (VIF) for continuous explanatory variables was used in this study. Following Gujarati (1995), VIF is defined as:

$$VIF\ (X_i) = \frac{1}{1-R^2} \quad \ldots\ldots\ldots\

Where:

Xi = the i^{th} quantitative explanatory variable regressed on the other quantitative explanatory variables.

R^2_i = the coefficient of determination when the variable X_i regressed on the remaining explanatory variables. If the value of VIF exceeds 10, it is used as a signal for existence of strong multi collinearity between continuous explanatory variables.

CHAPTER 4

RESULTS AND DISCUSSION

This chapter presents survey results of dairy marketing chains; in the case of Gondar town and the nearby selected *kebeles*, northwest Ethiopia. The study presents respondent's demographic profile, the role of dairy farm production use on dairy marketing, asset building and factors that influence dairy farm households' and traders decision to participate in milk and butter marketing systems in the study area.

4.1. Demographic and Socio-economic Characteristics

4.1.1. Demographic and Socio-economic Characteristics of Dairy Producers

The characteristics of respondents have important socio and economic implication on market access, participation and marketing decision making. Demographic characteristics of the sample dislocated respondents by age, gender, marital status, educational status were shown in Table 4.1 below. Sex of respondent has an economic implication in milk production and marketing. Sex has implication on the roles and responsibilities in the society, and therefore can influence households' abilities to generate income.

The Chi-Square analysis in Table 4.1 showed there was no significance difference with respect to sex of dairy household producers since the significance value (0.373) was greater than a priory alpha level (0.05). In the four dairy association sites, only *Tagleh Edeg in Azezo Akababi*, male sample population accounted 100 percent, while the rest account with equal proportions. This may be due to the fact that, dairy cow handling and management particularly feeding and grazing cow involve manual works hence both male and female are engaging in the milk production and marketing chain.

Likewise, the fact that actors in the milk value chain included both male and female, suggests a possibility of both men and women controlling most household resources and hence both play crucial role in household income generation.

Skills and education amplify the working efficiency resulting into more income and food security. Furthermore education is important to manage the business as well as in decision making. Regarding in educational status, results of the Chi-Square in table 4.1 indicated that there was a significance difference with respect to educational status of dairy farm associations. The largest gab occurred in *Tagleh Edeg Azezo Akababi* account that 57.1 percent and 28.6 percent of them were diploma and above, and grade 11-12 completed respectively with almost none of the others.

This educational status disparity might create difference in operations in the dairy production efficiency based on the recommended agricultural technology requirements among the categorized farm associations. Education matters in terms of reducing the costs of searching for information, knowing available sources and the route how to get it, which also could be a response to the previous experience.

The higher the level of education, the more correctly information will be processed, and this will increase its implementation value. The sample farmers have mainly junior, high school and college and above education, so they are generally literate having the essential knowledge of communication and negotiation with the buyer, but still do not possess a great expertise and power to limit the opportunism from the other party in the transaction process.

Table 4.1 Demographic characteristics of study population producers

Variables		Sample producer sites				Chi-square value	Sig value
		Loza-Mariyam	LamieBora&Arbiba	TaglehEdegAzezo	Azezo-Akababie		
Sex	male	62.5%	72.7%	100%	68.2%	3.571[a]	0.373[b]
	female	37.5%	27.3%	0.0%	31.8%		
Educational status	illiteracy	18.8%	13.6%	0.0%	18.2%	71.605[a]	0.000*
	Read & write	56.2%	4.5%	0.0%	18.2%		
	1-4	0.0%	27.3%	0.0%	22.7%		
	5-8	25.0%	27.3%	14.3%	27.3%		
	9-10	0.0%	22.7%	0.0%	13.6%		
	11-12	0.0%	4.5%	28.6%	0.0%		
	Diploma & above	0.0%	0.0%	57.1%	0.0%		
Marital status	married	75.0%	68.2%	100.0%	95.5%	20.185[a]	0.000*
	single	0.0%	18.2%	0.0%	4.5%		
	devours	18.8%	0.0%	0.0%	0.0%		
	widowed	6.2%	13.6%	0.0%	0.0%		
Religion	Orthodox	92.5%	95.9%	94.1%	98.5%	18.572[a]	0.000*
	Protestant	0.0%	0.1%	0.0%	0.0%		
	Muslim	7.5%	4.0%	5.9%	1.5%		

Significantly from each other at the .05 level. Source: household survey, 2016/17

Marital status was categorized as single, married, divorced and widowed (Table 4.1). The Chi-square results indicated that there was a significance difference regarding to marital status of farm associations, sig. 0.000 > @ (0.05). The majority of the respondents were married. Marital status might induce someone to work hard due to family responsibilities. The situation can be further explained by the fact that married respondents engage in dairy production activities in order to generate cash income to meet various household needs or requirement as well as expanding their household income base.

In the study area there was also a significance difference with regard to religion categories, the majority of them were Orthodox Christianity dairy producers. Only7.5 percent, 4.0 percent, 5.9 percent and 1.5 percent constitute Muslims at *Loza-Mariyam, LamieBora&Arbiba, TaglehEdeg-Azezo and Azezo-Akababie* dairy farm associations respectively.

The F-test of mean age of dairy farm associations in milk production ranged between 42.8 and 46.75 years and described as no significance difference among them (Table 4.2). The study revealed that there was more involvement of adult age group in the study area. This implies that many of respondents in the survey area were mature people who could be actively engaged in milk production and marketing to generate sufficient income to run their lives as well as their families. Age influences the income generating capacity of an individual. Regnard (2006) urges that in total the accumulation of wealthy is highly dependent on age of an individual, whereby a direct relationship is experienced. Likewise, age determines individual maturity and ability to make rational decisions. Mean household size was also significantly different among dairy farmers' household in the study area (Table 4.2) at a priori @ level since the significance value is less than it.

4.2 Socio-economic characteristics of producers

Variables	Sample producer sites (mean)				F	Sig value
	Loza-Mariyam	*LamieBora&Arbiba*	*TaglehEdegAzezo*	*Azezo-Akababie*		
age	46.75	42.82	45.14	46.00	0.854	0.470
family size	4.81	4.09	5.43	5.27	4.172	0.009*
Experience in dairy production	11.88	9.82	9.00	13.82	2.956	0.039*
number of local cows	2.56	2.32	3.14	1.62	5.328	0.002*
number of cross cows	2.06	2.68	2.00	3.23	5.399	0.002*
number of exotic cows	1.44	1.50	2.48	1.71	0.785	0.508
quantity of milk produced per cow per day	11.81	11.27	12.14	11.27	0.118	0.949

Significantly from each other at the .05 level. Source: household survey, 2016/17

In terms of dairy producing experiences, the F-test revealed that there was a significance mean difference of experiences among dairy farm associations. *Azezo-Akababie and Loza-Mariyam* dairy farm associations had relatively higher experiences than the rest of the two farm sites. Higher experiences of households might adopt and easily flexible for facing of challenges and talking of risks.

There was also a significance difference mean of owning number of local cows and cross cows (hybrids) among farm associations in the study area while having average herd size of exotic cows were no significance difference. However, there was a significance difference of owning of number of cows, there was no significance difference regarding of the quantity of milk produced per cow per day in the farm associations.

Herd sizes by type

In the study area, the number of herding animals by their types of local, cross breed and exotic animal types as presented below the figure: cross breed cows were constitute the largest portion followed by local breed cows while exotic cows attained the list proportion.

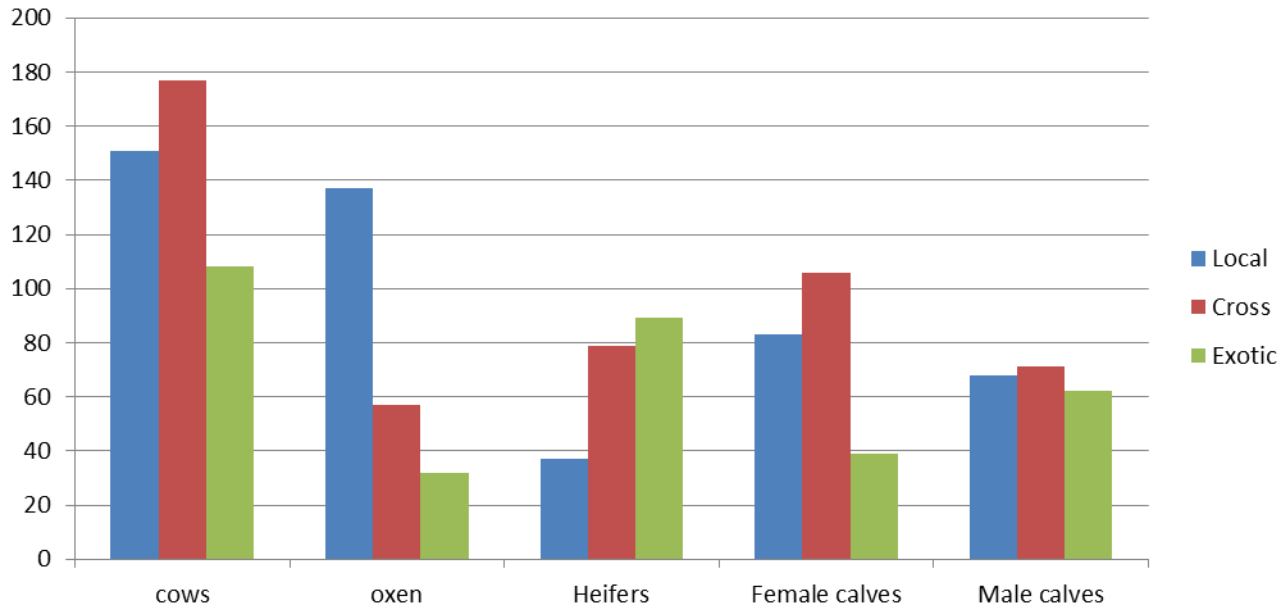

Figure 4.1 herd size status in the study area by type Source: household survey, 2016/17

The size of oxen local types by far was the greatest group and then the cross and exotic breeds constitute as decreasing in number. The reason why local oxen obtained the largest size was because some dairy farmers whose economy established in crop cultivation prefers the local one so as to minimize as local animals takes less feed consumptions as compared to the rest.

Whereas but the size of heifers outnumbered by exotic animal types followed by cross breed and local heifers. This might be made a good probability of the size of cows in the study area thereby the productivity of dairy farming. Female calves and male calves accounted as the size of cows in their respective sizes.

4.1.2. Demographic and Socio-economic Characteristics of Sample Dairy Traders

Milk and butter traders: Table 4.3 and 4.4 depicts that sex, educational status; marital status, religion, age, family size and business experience of the sampled milk traders were comparable across the sample locations. The chi-square test statistics shows that education and religion were found to be different across the sample locations and were statistically significant at 5 percent significance level.

The F-test statistics also revealed that the mean age of milk and butter traders of café and bar and restaurants were found to be statistically different at 5 percent significance level.

Table 4.3 Demographic characteristics of study population

Variables		Sample dairy traders (mean)		Chi-square value (X^2)	Sig value
		Café (N= 46)	Bar & Restaurants (N=21)		
Sex	male	80.4%	95.2%	2.488[a]	0.110
	female	19.6%	4.8%		
Educational status	illiteracy	-	-	12.388[a]	0.030[*]
	Read & write	13.0%	-		
	1-4	6.5%	0.0%		
	5-8	15.2%	0.0%		
	9-10	21.7%	14.3%		
	11-12	21.7%	47.6%		
	Diploma & above	21.7%	38.1%		
Marital status	married	73.9%	81.0%	6.899[a]	.060[b]
	single	17.4%	9.5%		

	devours	8.7%	0.0%		
	widowed	0.0%	9.5%		
Religion	Orthodox	67.4%	95.2%	6.170[a]	0.030[*]
	Protestant	2.2%	0.0%		
	Muslim	30.4%	4.8%		

Significantly from each other at the .05 level. Source: household survey, 2016/17

Regarding business experiences, the survey result in Table 4.4 had been shown that there was statically significance difference in business experience of the milk and butter traders across the sampled categories at a priori @ level (5%). On average, business experience of sampled bar & restaurants were 5.61 years more times than café traders of milk and butter. This implies that bar & restaurant traders of milk and butter had better probability of managerial skills of business planning and maximizing of profit opportunities and financial accumulation.

4.4 Socio-economic characteristics of retailers

Variables	Sample Retailers (mean)		F	Sig value
	Café (N= 46)	Bar & Restaurants (N=21)		
Age	48.35	53.76	4.524	0.037*
Family size	3.95	3.57	0.713	0.402
Business Experience	12.72	18.33	4.394	0.040*

Significantly from each other at the .05 level. Source: household survey, 2016/17

4.2. Dairy Production and Market Channels

4.2.1. Lactation Period and Dairy Production

Dairy farming is intensive production which is intended to produce maximum yields; therefore cows are pushed to their physiological limits through a combination of selective breeding, high protein feeds, and corresponding technology. As intensive interview were accomplished with key informants, to keep milk production as high as possible, farmers artificially inseminate cows every year, with creating in advance an unnatural milking schedules to keep the cows pregnant. Consequently, the dairy cow is made pregnant again whilst lactating.

The survey result showed (Table 4.5) that the average milking days/lactation period in the study areas was found to be 301.25 days for local breed dairy cows and 495.1 liters of milk per cow. From these 305 days of maximum with 519.5liters of milk per cow at *Loza-Mariyam* farm

association and 290 average lactation period of minimum producing of 478.5average liters of milk per cow in the respective dairy farm type.

The average milking days of a cow for cross breed dairy farm groups was 293.5 days and the estimated average milk production per cow was 1593.575 liters. *Tagleh EdegAzezo* was contributed the maximum lactation period which was 300 days per cow and had producing on average 1650 liters of milk.

However, a lactation period recorded at *LamieBora* & *Arbiba*farm association cross breed cows produced minimum of 287 days, but had contributed the maximum milk production which was on average 1661.25liters of milk per cow. When we also triangulating *Loza-Mariyam* and *Azezo-Akababie* dairy farm associations, there was a slightly difference of average lactation period and average milk productivity per cross breed cow.

With regard to exotic cows, the survey result revealed that the average total lactation period was 281.4 days per cow and the expected average total milk production of the study farm associations was calculated to be 2810 liters of milk per cow of those days. Exotic cows of *Loza-Mariyam* were lasting the longest milking day but contributed the smallest amount of average milk productivity while *Tagleh Edeg Azezo* was the reverse of this.

Table 4.5 Milk production and Lactation period (days) per cow by dairy farm type in farm sites

Farm association sites	**Milk production & lactation days of dairy farms**					
	local cows		cross cows		exotic cows	
	Lactation period	mean milk yield	Lactation period	mean milk yield	Lactation period	mean milk yield
Loza-Mariyam	305	519.5	292	1525.3	290.6	2615.6
LamieBora&Arbiba	310	457.25	287	1661.25	285	2778.75
TaglehEdegAzezo	290	478.5	300	1650	270	2767.5
Azezo-Akababie	300	525	295	1548.75	280	3080
Mean	**301.25**	**495.1**	**293.5**	**1593.575**	**281.4**	**2810**

Source: household survey, 2016/17

In general, average total lactation period and average total milk production for cross breed cows were found to be the longest and the lowest of all dairy farm types in the study area respectively and exotic cows were contributed the highest average total milk production with relatively shortest milking days.

A dairy cow is milked once a day, early in the morning, or twice a day, also in the late afternoons. Thereafter, the milk is collected in milk cans by on smaller farms of farm households.

The survey result of the F-test statistics indicated that sampled local cows, cross cows and exotic cows were 1.87 liter, 5.36 liter and 9.33 liter of mean milk produced respectively, so that significantly different with regard to yield of mean milk per day per cow at less than 5% probability level (table 4.6). It ranges from maximum of 11 liter per day per cow at exotic cows to a minimum of 1 liter of it at local cows. The share of milk sold was the highest in exotic cows' dairy farms mainly due to their larger production base and more market-oriented production objectives. The share of local cows' dairy farms in milk market participation was found to be small in terms of quantity which was due to limited per capita milk production while in the cross cows contributed on their middle average quantity. However, there was no significant difference mean milk market price per day in Ethiopia Birr in all of them since the sig. value is greater than a priori @ level. In the same fashion, the computed test statistic (F*) of the surveyed sample population the supply of butter per week in liter was statistically significance difference at less than 5% probability level implying that the 'F'-value associated with this parameter was substantially the highest in the cross cows dairy farm types which was produced greater by 2.08 and 0.15 liter of butter per week than local & exotic cows respectively.

Table 4.6 Yield of Mean milk per/cow/ day & butter per week and their respective market price

Item	Dairy farm types									F	Sig value
	local cows			cross cows			exotic cows				
	mean	min	max	mean	min	max	mean	min	max		
milk yield per day/ltr	1.87	1	2	5.36	2	7	9.33	5	11	889.328	.000*
price of milk/Ltr/Brr	14.54	13	15	14.72	14	15	14.76	14	15	0.107	.899
butter yield per week/lt	1.63	1	2	3.71	3	5	3.56	2	5	18.066	.000*
price of butter/Ltr/Brr	125.33	120	130	137.86	110	130	129.11	120	130	.336	.716

Significantly at 0.05 probability level. Source: household survey, 2016/17

4.2.2. The Dairy Marketing Chain in the Study Area and communication

In this study, different milk and butter market contributors were identified in the exchange functions between producers and the final consumers. These were: producers, cooperative, retailers (café and bar and restaurants) and consumers for both milk and butter market.

In Gondar town as shown in Table 4.7, the first dairy linkages were dairy producers supplied from four farm associations. The survey in the study area has established that small dairy farmers market their milk through different outlets. It has been responded regarding to the primary selling outlets of milk & butter production was that 53.7 percent , 34 percent and 13.4 percent of small holder dairy farmers in the study area sold their milk via retailers, direct to consumers and cooperatives respectively.

4.7. Dairy marketing channel outlets in the study area

Sample populations	Primary selling outlets of milk & butter production				
Producers	Direct to consumers	retailers	Cooperative	Semi-whole sellers	whole sellers
	23 (**34%**)	36 (**53.7%**)	9 (**13.4%**)	-	-
Retailers	What is your Primary source milk and butter demanded?				
	Monthly contract from producers	cooperative	Shop/powder milk	Open market point	
	48 (**71.6%**)	19 (**28.4%**)	-	-	

Source: household survey 2016/2017

On the other hand, the findings indicate that with regard to the primary source of milk and butter demanded of the retailers (café, bar & restaurants), 71.6 percent of them got through monthly contract (formal channel) from dairy farmers and the remaining 28.4 percent retailers responded that they channel their milk via the formal channel from dairy cooperatives. As depicted in table 4.5, 495.1, 1593.575 and 2810 liter of average milk was produced and distributed by dairy smallholders per a cow from local cows, cross cows and exotic cows and with their average lactation period of 301.25, 293.5 and 281.4 respectively in the study area.

In the study area, producers a distance of carrying milk and perform the door-to-door selling it. Dairy farmers sell their surplus milk and butter to different types of their customer in Gondar town, such as, individual consumers at market, contract households, cafés, bars and restaurants.

In this marketing channel, as the "F" test proved (table 4.6) that price of milk and butter was no significance difference in the market place. However as detailed interview was discussed with retailers and consumers there was an inadequate / opaque system of quality control (e.g. milk fat content) at the supply level producers. The producers operate without self-regulating and sometimes adulterate milk by adding water to increase volumes or chemicals to prevent the milk from turning sour. Sometimes milk is clotted because of unclean can used for collection, storage and transportation.

Fasil dairy cooperative center is the only cooperative that provides only raw milk for Gondar town. As detailed interview was carried out with the executive of *Fasil* dairy cooperative, the institution was established in 1987 with ten members and collected milk from dairy producers especially from *Hawaria Pawulos*, *Azezo Abasamual* dairy associations and individual dairy suppliers from the surrounding areas with the capital of 5000Birr. The cooperative societies were reluctant to purchase members' produce (milk) especially in fasting days. However, during holiday they bought excess of raw milk and distributed for cafés, hotels, bar and restaurants as well as direct to consumers during early in the morning and afternoon began at 11:00 o'clock without perishable of it.

The cooperative members have understood the advantages and benefits of being organized in a cooperative, rather than being alone. The marketing participation of members in their dairy Cooperative is reflected mostly in terms of supply or sale of raw milk to the society. Members were not involved in purchase of processed dairy products like butter. According to the participants, though the members have been participating in their dairy marketing, it was not as enough as the extent that it would have been expected to be.

The buying price and selling price of milk chain actors were examined. *Fasil* milk cooperative bought raw milk collecting from producers by 13.5Birr per liter and sold by 15Birr per liter direct to consumers and to retailer. The average quantity raw milk bought per a day was estimated about 800 liter with total price of 10800Birr and sold with the total price of 12000Birr. The average marketing margins was 1200Birr per a day as computed as the difference of the buying price and sold price, and it would be 36000Birr of revenue per a month.

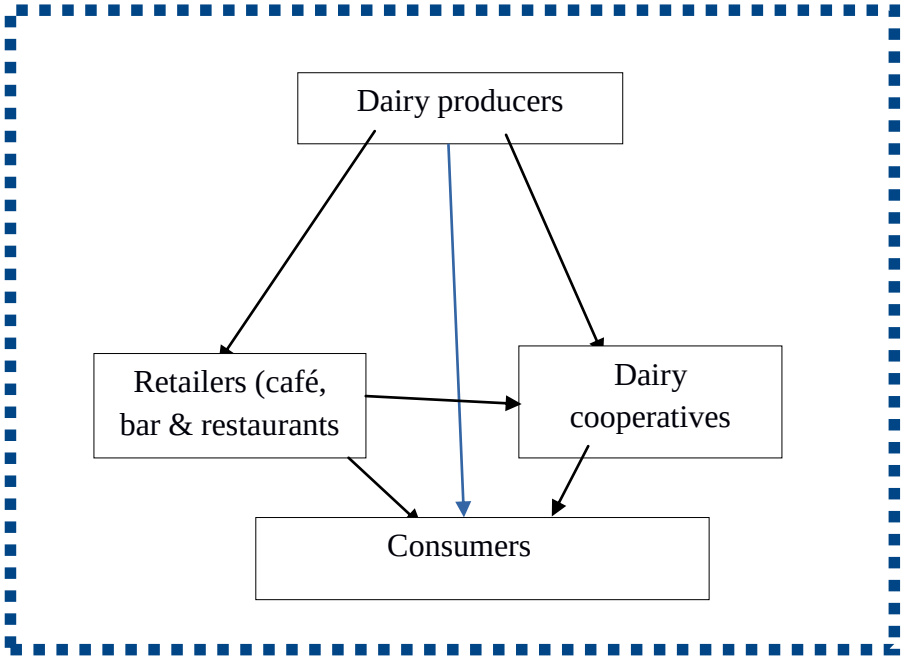

Figure 4.2 Milk flows in Gondar town/2017

The major constraints of the cooperative was reluctance of members in delivering milk to their society, failure of members to fulfill their membership obligation like payment of share capital, lack of commitment and negligence of members and lack of strong technical support from cooperative promotion offices found at different levels, lack of adequate awareness of members about their cooperatives, unreliable milk supply and price fluctuation of dairy products.

The major milk and butter marketing channels in Gondar town are:

Producers' → consumers

Producers' → cooperative → retailers' → consumers

Producers' → cooperative → consumers

Producers' → retailers' → consumers

The extent of market transparency refers to the adequacy, timeless and reliability of market information that the producers and traders have for their marketing decision. The existence of a large number of buyers and sellers does not guarantee competition and efficiency of the market unless the producers and traders have a proper knowledge of the functioning of the market. In a

transparent market, participants have adequate information about their competitors regarding their source of supply and buying prices for better decisions. The survey result in Table 4.8 depicted that producers and traders in the study area had varieties of butter and milk market information sources such as direct observation to market/sale places, friends or other traders through telephone and personal contact, consumers/ buyers, or a combination of two or more information sources.

In the study area, the means of market information sources for butter and milk access of production prices was through personal visit, friend/other traders and the customers. From the total sample category, majority of the producers (65.7%) got their primary access of information for their dairy markets to communicate price specification was through their friends/other traders by telephone, and the rest 21 percent and 13.4 percent of them communicate their prime market information receive due to personal visit and their customers in the market place respectively (Table 4.8).

Retailers (bar, bar and restaurants) were also got their access of information to communicate about their milk and butter market conditions was, 71.6 percent of sample households communicate their prime market information through their friends/other traders, 25.4 percent through personal visit and the remaining 3 percent got market information in the course of with their customers.

Table 4.8.Access of market information sources for Butter and Milk production

Sample populations	Ways of sources information		
	Personal visit	Friend/other traders	customers
Producers	14 (21%)	44 (65.7%)	9 (13.4%)
Retailers	17 (25.4%)	48 (71.6%)	2 (3%)

Source: household survey data 2016/2017

4.3 Milk and Butter Estimated Marketing Costs and Profits

4.3.1 Marketing costs of producers and retailers

Regarding of production cost and marketing costs of producers in table 4.9, *Azezo-Akababie* dairy association accounted the largest average production cost and marketing cost expenses (2545Birr), then next *Loza-Mariyam* dairy sample farm association average cost expenditure of 2135Birr per month. *Tagleh Edeg Azez*o dairy association was spent out the lowest expenditure regarding of labor costs which accounts on average 150Birr per month, this might be the sample households family size was the largest (5.43) as discussed in table 4.2 herein earlier.

Table 4.9. Average Production cost of dairy producers by sample Farm Associations per month

Expenditures in birr		Farm Associations				**Total**
		Loza-Mariyam/16	LamieBora&Arbiba /22	TaglehEdegAzezo /7	Azezo-Akababie/22	
Production cost/Birr	Feed cost	1700	1550	765	1900	**6950**
	Medicament	125	135	75	150	**510**
	Labor	250	300	150	400	**1650**
Marketing cost/Birr	Transport cost	60	75	45	95	**255**
	Spoilage	-	-	-	-	-
Total		**2135**	**2060**	**985**	**2545**	**9365**

Source: household survey, 2016/17

With regard to milk and butter marketing actors of retailers as far as possible to distribute in Gondar town (Table 4.10), the sample populations of café actors purchased 19.25 milliliter amount of average milk by an average price of 14.78Birr per day. The survey result also showed that out of the total butter marketed per week in the study areas by sample retailers, café market agents bought about 2.0milliliter amount of average butter by 157Birr per week in marketing channels. In the same fashion, retailers of bar & restaurants purchase 14.5ml & 2.75ml average amount of milk per day and butter per week by an average price of 14.55Birr &150.50Birr respectively in the study area.

Table 4.10. Average purchasing and selling of milk per day and butter per week price in litter.

Activities		Milk and butter Marketing actors of retailers				Total	
		café		Bar & restaurants			
		milk	butter	milk	butter	milk	butter
Purchasing	amount	19.25	2.0	14.5	2.75	16.875	2.375
	Price	14.78	157	14.55	150.50	14.665	153.75
Selling	amount	19	2.0	14.5	2.75	16.75	2.375
	Price	24.65	187.5	23.75	190.75	24.20	210

Source: household survey, 2016/17

With regard to selling participation of retailers, the sample café participants sold an average of 19ml of milk and an average of 2ml of butter by an average price of 24.65Birr & 187.5Birr respectively. Herein the total amount of purchased raw milk was not sold due to sometimes it remained when they purchased excess than the quantity demanded or during fasting days of Wednesday and Friday and changed in to yogurt. The sample survey of bar and restaurants also sold the total amount of the purchased raw milk and butter by 23.75Birr & 190.75Birr per day and per week respectively.

The survey analysis of marketing expenses of retailers indicated in table 4.11 that the average marketing out flow due transport, labor and tax paid costs for milk by bar and restaurants was greater (3.45Birr) than café participants, 2.35Birr per liter, but smaller in expenses of butter trading (3.75Birr)per liter.

Table 4.11. Average prices and marketing costs of milk &butter traders per litter

Operating Expenses	Milk and butter Marketing actors of retailers				**Total**	
	Café/46		Bar & restaurants/21			
	milk	butter	milk	butter	milk	butter
Transport cost	0.15	-	0.05	-	0.10	-
Labor cost	0.85	-	0.95	-	0.90	-
Tax paid	1.35	4.15	2.45	3.75	1.90	3.95
Total	**2.35**	**4.15**	**3.45**	**3.75**	**2.90**	**3.95**

Source: household survey, 2016/17

4.3.2. Marketing profit for milk market participants

Table 4.12 indicated that *Lamie Bora &Arbiba*dairy farm association producers had gotten the highest average cash earnings (11.718Birr) per liter of milk followed by *Azezo-Akababi* dairy farm association producers (11.51Birr) after they spent their production and marketing costs. However, *Loza-Mariyam* dairy farm association producers obtained 10.09Birr which was the least average earnings per liter of milk while *Tagleh-Edeg Azezo* was better (11.17Birr) earned of this per liter of milk. The total mean profit of producers in the study area after they spent their production and marketing costs estimated as 11.122Birr per liter of milk.

From the sample population of retailers, Café traders of milk had obtained higher average profit (7.52Birr) per liter of milk than bar and restaurants had obtained, which was 5.75Birr per liter of milk after they spent their expenditures. The total mean profit of retailer was obtained as 6.635birr per liter of milk. According to the survey result, café milk retailers had gotten higher profit whereas bar and restaurants milk traders had obtained less profit per litter.

This was because of the following reasons: café retailers sell relatively at higher price with less marketing costs since they are in most cases opportunist.

During the survey period, some café milk retailers was found to form oral contractual agreement with milk producers' in order secure milk supply at reasonable price.

Table 4.12. Monthly Marketing profit of dairy producer and traders/marketing agents/

Marketing cost and profit	**Milk marketing actors**				**mean**
	producers				**Total**
	Loza-Mariyam	LamieBora&Arbiba	TaglehEdegAzezo	AzezoAkababie	
Selling price	14.65	14.75	14.85	14.68	14.73
Production cost	4.43	2.76	3.52	3.05	3.44
Marketing cost	0.13	0.272	0.16	0.12	0.1705
Profit	**10.09**	**11.718**	**11.17**	**11.51**	**11.122**
	Retailers				
	café		Bar & restaurants		
purchasing price	14.78		14.55		14.665
Selling price	24.65		23.75		22.7
Marketing cost	2.35		3.45		3.54
Profit	**7.52**		**5.75**		**6.635**

Source: household survey, 2016/17

Retailers' marketing profit for butter traders as depicted in Table 4.13; average of 26.35Birr and 36.5Birr profit per liter of butter was obtained by café and bar and restaurant retailer respectively.

The average profit obtained by bar and restaurant butter retailers were found to be higher by 10.15Birr per liter of butter. The reason why bar and restaurant butter retailers had attained higher profit was that the majority them were found to purchase butter with cheaper price and relatively lower marketing cost were found to incur relatively less costs.

Table 4.13. Monthly Marketing profit of butter for retailers per liter

Marketing cost and profit	**Retailers**		**Total**
	café	Bar & restaurants	
purchasing price	157	150.5	153.75
Selling price	187.5	190.75	189.125
Marketing cost	4.15	3.75	3.95
Profit	**26.35**	**36.5**	**31.425**

Source: household survey, 2016/17

4.4. Major determinant factors of supply and demand in dairy marketing chain

Various variables are assumed to determine the sale volume of milk and of milk market participation by sampled dairy households. According to dairy production or supply of dairy those influential factors might hinder the productivity of it and the demand side of the population also far from the dairy utilization. The multiple regression model determines major factors of dairy producers and retailers the degree of their activity.

Before fitting the model, it was important to check whether there exists serious problem of multicollinearity among the hypothesized explanatory variables. The values of Variance Inflation Factor /VIF/ that is 4.16 and 3.22 for dairy producers and retailers respectively for each of the continuous variables were found to be less than ten and hence, there was no a multicollinearity problem among all the hypothesized continuous variables included in the model.

In addition, goodness of fit in multiple regression analysis is measured by count R^2 which indicates the number of sample observations correctly predicted by the model. The count R^2 is

interpreted based on the principle that if the predicted probability of the event is less than 0.50, the event will not occur, and if it is greater than 0.50, the event will occur (Maddala, 1981). Hence, the model results showed that the multiple regression model correctly predicted (R^2 = 0.76 for producers, and 0.69 for retailers) of sample households.

As it was indicated in table 4.14, there is no significance association between age of households and dairy productivity and marketing profit for both producers and retailers at 5% level of confidence, since the significance value (.077, and (0.367) is greater than that of the level of confidence (0.05).

However, educational status had negatively correlated and significantly different to the milk and butter productivity and marketing profit for the households of both producers and retailers in the study area at a priori @ level (0.05), and p-value 0.31 & 0.019 respectively. The coefficient of educational status of households' (B_2) -.347 revealed that for each a one unit of decrease educational status, there was also an increase in the amount of gross income of the household by -.347. That is the lesser the educational status, the worse the average gross income of the household which is negatively related, but not fit to the hypothesis. There was also the same fashion for retailers' dairy profitability which was decrease by -.680.

Household size is another strong factor positively associated and insignificance for the contribution of milk and butter productivity for producers and market profitability for retailers. The coefficient of B3, 0.464, revealed that a one unit increase family size increase by a 0.464 magnitudes of dairy productivity due an increase labor force. In the same manner, retailers maximize their profit by 0.347 magnitude as a one unit increase of their family size.

However, the number of having many cows increases milk and dairy productivity of farm household and significance at a priori @ level (0.05), since the sig value is less than it, p (0.000). A one unit increase of their cow size increased their milk and butter production by 1.562 unit.

Experience also the other common explanatory variable that determined dairy productivity and traders profitability status and it is a negative association and significance difference at 5% level confidence interval, p (0.041, & 0.0.027).

Table 4.14 Regression model result for determinants of dairy marketing

Independent Variables	Dairy producer				Independent Variables	retailers			
	B	Beta	t	Sig value		B	Beta	t	Sig value
Constant	10.777		6.695	.000	Constant	8.089		2.981	.004*
age	-.064	-.279	-1.819	.077	age	.051	.142	.909	.367
education	-.347	-.295	-2.245	.031*	education	-.680	-.292	-2.401	.019*
Family size	.464	.285	1.935	.061	Family size	.347	.208	1.799	.077
experience	-.120	-.316	-2.119	.041*	experience	-.128	-.343	-2.265	.027*
cows	1.562	.530	4.283	.000*					
Sample size Pseudo R^2	67 0.76				Sample size Pseudo R^2	67 0.69			

* Significant at or less than 5%, Source: Field survey, 2016/17

As portray in table 4.15 below, 68.2 percent and 62.5 percent of the sample population of *Lamie Bora&Arbiba* and *Loza-Mariyam* was faced by due labor shortage respectively, while *Tagleh Edeg Azezo and Azezo Akababie* was relatively better of this. So, labor is one of an influential factor that determines the production costs of dairy producers' rate of productivity of dairy.

As expressed earlier, there was a significance difference regarding to dairy household family size. This is because of the fact that household members represent labor resources for better management of dairy cows and, hence, are posited to be directly related to engagement in production and marketing activities.

Training also helps producers to close the gap of access of new technologies. If dairy producers should get short term training frequently, they might close their difference of agricultural technology limitations, thereby increasing their level of dairy productivity. However, majority of sample households of in all dairy farm associations didn't get training regarding to dairy activities. This might hampered the status of dairy producers' skills and ways of technical application systems in their dairy activities. Even if a few of them were gotten short term training, majority of them replied that as they got training between 2 and 6 months per a year,

only 40.9 percent of *Lamie Bora & Arbiba* dairy farm associations obtained short term training monthly. Besides to this, as it was verified earlier that there was a significance difference among sample farm association regarding to educational status which might be again down sloping the productivity of dairying in the study area. Since education improves the dairy household capacity to process production related and market related information, which in turn improves bargaining position.

Table.4.15 dairy producers' determinant factors

Variables and response alternatives		Loza-Mariyam	LamieBora&Arbiba	TaglehEdegAzezo	Azezo Akababie
Do you face labor shortage	Yes	62.5%	68.2%	28.6%	22.7%
	No	37.5%	31.8%	71.4%	77.3%
Did you get training in dairying?	Yes	87.5%	86.4%	100%	90.9%
	No	12.5%	13.6%	--	9.1%
If "yes", rate of training is	Less than 3 weeks of a month	--	-	-	-
	monthly	18.75%	40.9%	14.3%	20%
	between 2 and 6 months	56.25%	54.5%	57.1%	65%
	once a year	25%	4.6%	28.6%	15%
herd size status since starting of herding	increased	75%	36.4%	71.4%	68.2%
	Decreased	12.5%	54.5%	28.6%	22.7
	No change	12.5%	9.1%	-	9.1%
	Did not have any idea	--	--	--	--
Factors considered by sample milk producers in selling price setting	Distance from milk market	--	--		
	Quality of milk	--	--	--	--
	Consumer preference	25%	13.6%	42.9%	31.8%
	Price of milk	--	9.1	14.3%	13.6
	Season of demand and supply	75%	77.3%	42.9%	54.6%

Source: household survey, 2016/17

Experiences of sample dairy farm associations were also one of the prime factors that determine the development of dairy activity status since it was a significance difference among them (Table 4.2). Experiences in dairy production go in line with short term training activity and educational

status, thus marginal effect of these factors would lead to the probability of decreasing dairy productivity and household milk market participation.

The herd size status of dairy suppliers often affected by the herd size status for the productivity of dairy activities since starting of herding. 75 Percent, 71.4 percent, 68.2 percent and 36.4 percent of dairy farm associations of *Loza-Mariyam, Tagleh Edeg Azezo, Azezo Akababie and Lamie Bora & Arbiba* respectively replied their dairy herd size status since starting of herding was increased from time to time which might again increase the production level of dairying. However, the majority of *Lamie Bora & Arbiba* (54.5%) their herd size status since starting of herding decreased from time to time, and a few of them, *except Tagleh Edeg Azezo*, said their herd size status was no change since they began.

Sample populations considered that distance to their nearest dairy product market center was insignificant**.** The closer the dairy market to dairy household, the lesser would be the transportation charges, with no spoilage milk and butter and better access to market information and facilities. This closeness can improve return to labor and capital; increase farm gate price and the incentives to participate in economic transactions. However, problems related to Seasonality of demand and supply (production) of dairy was the principal factor for households. Sample dairy associations of *Loza-Mariyam (*75%), *Lamie Bora & Arbiba* (77.3%), *Tagleh Edeg Azezo (*42.9%) *and Azezo Akababie* (54.6%) responded that Seasonality of demand and supply (production) of dairy was their major problem. As FGD was in detail interviewed with the key informants, the more number of days a Christian person is fasting and decreasing the demand of milk, then after decreases the price of milk with regard to their spiritual faith. They stated that most of them collected raw milk and processed to produce butter during the fasting days if it is remains so long. In the other hand during the rainy season the productivity of milk is much greater than the dry season and the production cost of feeding become decrease, resulting in a better economic return. 42.9 percent of *Tagleh Edeg Azezo and* 31.8 percent of *Azezo Akababie* dairy farm associations were influenced due to consumer preference in selling price setting, and the remaining 25 percent & 13.6 percent of *Loza-Mariyam* and *Lamie Bora & Arbiba* respectively described in the same respect.

As it is depicted from table 4.16, distance was not affect milk demander's of Café, bar and restaurants from milk market due to most of them got their milk from producers by direct delivery to them , even if some of them brought from *Fasil* dairy cooperative, it was a significant cost of transport impact as few of them interviewed.

However, 43.5 percent of café and 33.3 percent of bar & restaurants were affected due to the quality of milk they purchase was as low standard, while 39.1 percent and 57.2 percent respectively again seasonality of demand and supply determines their state of purchasing price setting.

Table.4.16. dairy demander's' determinant factors

Variables and response alternatives		Café	Bar & restaurants
Factors considered by sample milk demander's in purchasing price setting	Distance from milk market	--	--
	Quality of milk	43.5%	33.3%
	Supplier /consumer preference	13.04%	9.5%
	Price of milk	4.4%	--
	Season of demand and supply	39.1%	57.2%
challenges in your milk and butter marketing	Cost of milk and butter	10.9%	9.5%
	Demand side	26.1%	47.6%
	Supply side	63.0%	42.9%

Source: household survey, 2016/17

63.0 percent of café milk and butter traders were faced that the supply side during the dry season of this goods were the major challenge for their dairy marketing that is why they sometimes substituted by dry powder milk while 26.1 percent and 10.9 percent of them confront by demand side: low consumption behavior during fasting and non-fasting period against dairy products consumption and cost of milk and butter respectively.

Retailers of bar & restaurants also stressed by demand and supply side with almost equal proportion of them.

4.5. Major Challenges of Dairy Production and Marketing

Challenges of dairy production coincide with cost of production: due to severe shortages of animal feed supplies in different seasons, the cost of running a dairy farm is expensive. Inadequate supply of quality feed especially during the dry seasons was major factor limiting dairy productivity in the study farm association areas. Feed, usually based on fodder and grass, were either not available in sufficient quantities due to fluctuating weather conditions or when available were of poor nutritional quality. In the study farm associations, as shown table 4.16, 59.1percent , 42.9 percent, 41 percent and 37.5 percent of *Lamie Bora & Arbiba, Tagleh Edeg Azezo, Azezo Akababie, and Loza-Mariyam* dairy farm associations respectively influenced by severe shortages of animal feed supplies in different seasons.

These constraints result in low milk, high mortality of young stock, longer parturition intervals, and low animal weights. The demand side of dairy production also one of the prime challenges due to the consumers' behaviors specially Christianity religion followers with low Consumption behavior during fasting and non-fasting period against dairy products consumption. With this regard, 56.25 percent, 50percent, 42.9 percent and 27.3 percent of *Loza-Mariyam, Azezo Akababie, Tagleh Edeg Azezo* and *Lamie Bora & Arbibadairy* farm associations respectively encountered by low Consumption behavior during fasting and non-fasting period against dairy products consumption. These constraints result in decrease of the cost of milk and milk products even spoilage of the milk also happen as if the low demanded behavior the dairy products.

A few number of dairy farm associations also constrained by a sever challenge of lack of modern animal husbandry and management and prevalence of animal diseases and inadequate access to veterinary drugs and services.

Table 4.17. Challenges in dairy production and marketing

Challenges in dairy production and marketing	Loza-Mariyam	LamieBora&Arbiba	TaglehEdegAzezo	AzezoAkababie
1. Cost of production: Due to severe shortages of animal feed supplies in different seasons, the cost of running a dairy farm is expensive	6(37.5%)	13 (59.1%)	3 (42.9%)	9 (41%)
2. Demand side: Low Consumption behavior during fasting and non-fasting period against dairy products consumption.	9(56.25%	6(27.3%)	3 (42.9%)	11 (50%)
3. Management: Lack of modern animal husbandry and management	1 (6.5%)	2 (9.1%)	-	1 (4.545)
4. Prevalence of animal diseases and inadequate access to veterinary drugs and services	-	1 (4.545)	1 (14.2%)	1 (4.545)
Total	100%	100%	100%	100%

Source: household survey, 2016/17

Participants of the FGD explained that there are various personal, situational, psychological, and socio-economic factors that hinder members' of dairy farm associations and cooperatives from effective marketing participation. These include: Lack of access to market for their dairy products, lack or absence of milking cows (due to cease of lactation period of dairy cows and sudden death of a cow as a result animal diseases), traditional dairy marketing system (no modern and efficient dairy marketing system), lack of timely and reliable market information and fair price for their dairy products, scattered (non-coordinated) local milk markets, unreliable milk supply, low productivity of local breeds, no milk processing plants, weak transfer of market information, price fluctuation of dairy products, high transaction costs and ever increasing in the price of animal feeds , lack of improved dairy cows and high cost of exotic breeds and shortage of formulated animal feeds and grazing land.

Furthermore, the focus group discussion established that access to stock-feeds and adequate fodder provisions in addition to good dairy genetics were the major constraining factors for their associations. The need for an extension officer attached (closed) to the dairy was highlighted.

As interview was carried out with key informants, other problems and /or challenges that were hindering dairy farmers to channel milk through formal channel there were no milk collection centers which would have encouraged dairy farmers to channel milk via formal channel. They recognized that milk collection centers reduce their marketing and labor production costs. When we paraphrase, the other function is it likely makes job creation of others and zooming out of marketing channels.

As discussion was continued especially with senior dairy producers in this contemporary argued that dairy productivity, selection of improved cows and bulls, the way of the government giving attention and expansion of extension services to increase livestock and livestock products, the demand of milk from year to year were much greater than our earlier activities of livestock and their products as we have done to fulfill our basic needs. And further they informed that the accessibility of road infrastructure, transport, and communication technology like mobile highly interconnects our ideas and activities (socioeconomic) with our customers has made more straightforwardly than we had had performing earlier. The demand side of retailers and consumers also supported the idea that even if the cost of milk has increased from time to time, it is relatively better than other edible articles, especially café, bar and restaurants strongly expressed that as they finished their dairy marketing services earlier before the afternoon.

Herein, the researcher infer that even if the productivity of dairy was increase from time to time, population of Gondar also increases implying that the demand side of dairy also increases. So, engaging in dairy farming should be given highly attention in all key stakeholders if possible the government should have appreciating and subsidizing the sector.

CHAPTER 5

CONCLUSION AND RECOMMENDATION

5.1. Conclusion

Through the supply and demand chain analysis of dairy marketing in this study, demographic characteristics of the sample populations of producers except sex, variables of gender, marital status, educational status and religion as the Chi-Square analysis indicated were highly significance at a priori alpha level, thereby a made a great variations in an economic implication in milk production and marketing. In the four dairy association sites, except *Tagleh Edeg in Azezo Akababi* male accounted 100 percent, the rest accounts both male and female sexes and engaging in the milk production and marketing chain with equal proportions. The fact that actors in the milk value chain included both male and female, suggests a possibility of both men and women controlling most household resources and hence both play crucial role in household income generation. Socio-economic characteristics of age, family size, experience in dairy production, together with the number of local, cross and exotic cows also contributed in the supply of dairy productivity and distributed to retailers, cooperatives and direct to consumers.

Dairy farming production, on average /lactation period in the study areas was found to be 301.25 days for local breed dairy cows and 495.1 liters of milk per cow. The average milking days of a cow for cross breed dairy farm groups was 293.5 days and the estimated average milk production per cow was 1593.575 liters. And with regard to exotic cows, the survey result revealed that the average total lactation period was 281.4 days per cow and the expected average total milk production of the study farm associations was calculated to be 2810 liters of milk per cow of those days. In general, average total lactation period and average total milk production for local cows were found to be the longest and the lowest of all dairy farm production types respectively while exotic cows were contributed the highest average total milk production with relatively shortest milking days. A dairy cow is milked once a day, early in the morning, or twice a day, also in the late afternoons. Thereafter, the milk is collected in milk cans and local utensils by farm households.

The survey result of the F-test statistics indicated that sampled local cows, cross cows and exotic cows were 1.87 liter, 5.36 liter and 9.33 liter of mean milk produced respectively, so that significantly different with regard to yield of mean milk per day per cow at less than 5% probability level. However, there was no significant difference mean milk market price per day in Ethiopia BIRR in all of them since the sig. value is greater than a priori @ level. In the same fashion, the computed test statistic (F*) of the surveyed sample population of butter per week in liter was statistically significance difference at less than 5% probability level with no significance price difference.

Dairy farmers sell their surplus milk and butter to different types of their customer in Gondar town, such as, individual consumers at market, contract households, cafés, bars and restaurants as well as for cooperative. *Fasil* dairy cooperative center is the only cooperative that provides only raw milk for Gondar town which was established in 1987 with ten members and collected milk from dairy producers especially from *Hawaria Pawulos*, *Azezo Abasamual* dairy associations and individual dairy suppliers from the surrounding areas with the capital of 5000Birr. The cooperative collects and distributes raw milk for cafés, hotels, bar and restaurants and direct to consumers during early in the morning and afternoon began at 11:00 o'clock without perishable of it.

Regarding of production cost and marketing costs of producers, *Azezo-Akababie* dairy association accounted the largest average production cost and marketing cost expenses (2545Birr), then next *Loza-Mariyam* dairy sample farm association average cost expenditure of 2135Birr per month. *Lamie Bora &Arbiba* dairy farm association producers had gotten the highest average cash earnings (11.718Birr) per liter of milk followed by *Azezo-Akababi* dairy farm association producers (11.51Birr) after they spent their production and marketing costs while *Loza-Mariyam* dairy farm association producers obtained the least average earnings (10.09Birr) per liter of milk.

With regard to milk and butter marketing actors of retailers; café actors purchased 19.25 milliliter amount of average milk by an average price of 14.78Birr per day they bought about 2.0milliliter amount of average butter by 157Birr per week in marketing channels. In the same fashion, retailers of bar & restaurants purchase 14.5ml & 2.75ml average amount of milk per day and butter per week by an average price of 14.55Birr &150.50Birr respectively in the study area.

With regard to selling participation of retailers, the sample café participants sold an average of 19ml of milk and an average of 2ml of butter by an average price of 24.65Birr & 187.5Birr respectively. The sample survey of bar and restaurants also sold the total amount of the purchased raw milk and butter by 23.75Birr & 190.75Birr per day and per week respectively. Their marketing expenses for transport, labor and tax paid costs for milk by bar and restaurants was greater (3.45Birr) than café participants, 2.35Birr per liter, but smaller in expenses of butter trading (3.75Birr) per liter. Café traders of milk had obtained higher average profit (7.52Birr) per liter of milk than bar and restaurants had obtained (5.75Birr) per liter of milk after they spent their expenditures.

Major determinant factors for the supply dairy producers were labor; household family size, short term training and educational status, herd size status of dairy suppliers, seasonality of demand and supply (production) of dairy, distance to the nearest market center and experiences of sample dairy farm associations were identified as influential factors that determine the production and marketing costs of dairy producers' rate of productivity of dairy.

43.5 percent of café and 33.3 percent of bar & restaurants were affected due to the quality of milk they purchase was as low standard, while 39.1percent of and 57.2 percent respectively again seasonality of demand and supply determines their state of purchasing price setting. They were faced that the supply side during the dry season of milk and butter were the major challenge for their dairy marketing that they sometimes substituted by dry powder milk while 26.1 percent and 10.9 percent of them confront by demand side.

Participants of the FGD explained that there are various personal, situational, psychological, and socio-economic factors that hinder members' of dairy farm associations and cooperatives from effective marketing participation. These include: Lack of access to market for their dairy products, lack or absence of milking cows (due to cease of lactation period of dairy cows and sudden death of a cow as a result animal diseases), traditional dairy marketing system (no modern and efficient dairy marketing system), lack of timely and reliable market information and fair price for their dairy products, scattered (non-coordinated) local milk markets, unreliable milk supply, low productivity of local breeds, no milk processing plants, high transaction costs and ever increasing in the price of animal feeds , lack of improved dairy cows and high cost of exotic breeds and shortage of formulated animal feeds and grazing land. Furthermor**e,** the focus group

discussion established that access to stock-feeds and adequate fodder provisions in addition to good dairy genetics were the major constraining factors for their associations. The need for an extension officer attached (closed) to the dairy was highlighted.

5.2. Recommendation

In order to tackle the main constraints of dairy marketing channels identified during the survey and improve marketing participation of members in their dairy marketing so as to realize the white revolution (that has happened in other parts of the world) through dairy production and trading strategies in the study area in particular, the following recommendations have been made based on the findings of the study;

- ➔ In the study area the herd size status since starting of herding became decreasing specially at *Lamie Bora & Arbiba and Tagleh Edeg Azezo* dairy far associations. Therefore, the woreda agricultural officers the zone, the reional government and the federal livestock officials with other team workers should look forward in near contact dairy farm owners for sustainable production sector of dairy farm associations to aid based on animal science agricultural technology recommended technical tools to boost dairy farm productivity. It should be Continuous follow up and control the activities of cooperative officials and taking corrective measures on the problems observed as necessary.

- ➔ There was a great gap among dairy producers and traders regarding about educational status and working experience. The agricultural development officials and other team workers should be preparing and giving Continuous short term training through Pro gramme to close the gap of cognitive and skills of dairy channel actors.

- ➔ The current production level of milk per day and butter per week per cow should be necessarily appreciable and award-able responses. Making it in use of as a reference date and a reference production level, then it should be quick call for scaling up the level of production through promotion and subsidizing the dairy sector for improving the type of dairy breeding cows and establishing of adequate feeds and fodders.

- ➔ Even if it was a good start up stage, any kind of supportive provision services for the dairy farm associations by the agriculture development institutions was unsatisfactory. Therefore, proper and monitored provisional services should be provided by the

agricultural animal science officials and other team workers in the form of regular veterinary medical care services, artificial insemination facilities, extension services, demonstrate improved fodder cultivation to members etc. are instrumental in ensuring higher supply of milk in their area of operation. Finally, they have to help members in maintain proper recording of provisional service data, following-up and giving immediate feed backs to the changes.

➔ The dairy stakeholders (producers, retailers, cooperatives, Government, and N.G.OS) should think of better market access for dairy products, dairy union should established to link the suppliers and demander's of the dairy product market should be different sales promotion methods should be adopted and revised from time to time (as necessary). Moreover, milk processing plant at dairy cooperative union level (when its financial position allows it to do so) must be established so as to convert the raw milk to other processed milk products and thereby elongate the shelf life of dairy products.

➔ Continuous follow up and controlling the activities of dairy farm association sites, cooperative officials should be auditing based on standardized instruments by internal and external auditors and taking corrective measures on the problems observed is imperative for the success of dairy development.

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APPENDICES

Appendix I: Household survey questionnaires for dairy farmers

Gondar University: Marketing Management Analysis of Dairy Marketing Chain; in the Case of Gondar Town and the nearby *Kebeles*, Northwest Ethiopia.

Case Study Questionnaire

Region-----Adm.Zone----------Peasant Association----------

I**. Personal Information**

1. Household head:- **Sex**: 1.Male----; Female-----; **Age:** ---- **Education status**:----------

2. Family size and educational status

size	male	female	**Total**
<10			
11 up to 20			
>21+			
Total			

Educational grade	male	female	**Total**
illiterate			
1-4			
5-8			
9-10			
11-12			
Diploma & above			
total			

3. Marital status A. Single C. Divorced B. Married D. Widow or widower

4. Religion: A. Orthodox B. Protestant C. Muslim D. Catholic E. Other (specify----------

II. **Organizational activity of dairy farming**

1. Date of establishment of the dairy farm_____

2. What was your reason to engage in dairy farming? _____

3. How many years of experience do you have in dairy farming? _____

4. Do you face labor shortage problem in your dairy farming enterprise? A) Yes B) No

5. If your answer for the above question is yes, how do you solve the problem?

A) Hiring full time workers B) Hiring part time worker

C) Asking for cooperation D) All E) Others (Specify)_____

7. Where do you perform your dairy farming activity?

A. In backyards B. In open space

C. In urban fringe areas D. Others (specify) _____

8. Is your dairy farm equipped with enough housing (barn)? A. Yes B. No
9. What is the type of floor for the barn?

A. Cement B. Stone tile C. soil D. other (specify) _____

10. Does the barn contain a feed through? A. Yes B. No

11. Does the barn contain enough ventilation? A. Yes B. No

12. Which of the following environmental shocks have been experienced since you started dairy farming activity?
A. Droughts B. Floods C. Landslides D. Pests E. Diseases F. others (please specify)
_____

13. Are you a member of dairy farming farmers' association? 1. Yes 2. No

14. If you are a member what benefits do you get?

1. Credit Service 2. Input Supply 3. Technical support

15. How do you get information on dairying production most of the time?

1. Radio 2. Newspaper 3. From farmer's association 4. From extension agents

16. Type of market information sources for your Butter and Milk production?

1. Personal visit 2. Friend/other traders 3. Consumers/customers

17. Did you have any formal training in dairying? 1. Yes 2. No

18. If yes, for how long time did you take the training?

1. Less than 3 weeks of a month 2. Monthly 3. Between 2 and 6 months 4. Once a year

19. What type of animal are you keeping for dairy? Write a number of them.

		Local	Cross	Exotic	total
cows	lactating				
	dry				
oxen					
Heifers					
Female calves					
Male calves					

20. What is your herd size status since you starting of herding?
1. Increased
2. Decreased
3. No change
4. Did not have any idea about the trend of the herd size

21. Do you have processed your fresh milk to produce butter? 1. Yes 2. No

22. What are your Primary purposes dairy of milk and butter production?

1. For sale 2. For consumption 3. For both sale and consumption

23. What is your utensils you utilize for storage of milk and processing of butter?

1. Clay pot 2. *Kill* 3 nickel or plastic milk utensils 4. Locally made grass utensils

24. Amount of estimated average lactation period, production and sales of milk and price of butter per cow

Production of	Local cows			Hybrid cow			Exotic cows		
	Lactation period	Production/litter	birr	Lactation period	litter	birr	Lactation period	litter	birr
Milk/day									
Butter/week									

25. How many times do you milk your cows per day?
1. Morning only 2. Morning and evening 3. Morning, mid-day and evening

27. Which transport means are you using to transport your dairy products for sale most of the time?
1. Public transport 2. Traveling on foot 3. Using pack animals

28. Factors considered by sample milk producers in selling price setting

1. Distance from milk market 2. Quality of milk 3. Consumer preference 4.Price of milk

5. Season of demand and supply 6. If any other, mention----------

29. Factors considered in butter price setting

1. Distance from milk market 2. Quality of butter 3. Consumer preference 4.Price

5. Season of demand and supply 6. If any other, mention----------

30. How much you spent production cost and marketing cost of dairy activities per month?

Cost of items (Birr)					
Production expenditure			Marketing cost		**Total**
Feed cost	Medicament	Labor	Transport cost	Spoilage	

31. What are your Primary selling outlets of milk & butter production?

1.Direct to consumers 2. Catering institutions (tea or coffee houses)/retailers

3. Cooperative 4. Semi-whole sellers 5. Whole sellers

32. What are your Primary criteria for selection of selling outlets?

1. Proximity 2. Better price 3. Proximity and better price

4. Lack of alternative 5. Guaranteed contract for whole month

33. Butter and milk traders purchasing and producers selling strategies is based on

1. Negotiation 2. Market 3. Producer 4. Buyer

34. What is your willingness of dairy farming in the future?

1. Willing to continue, expand and/or involve in dairying in the future

2. Maintain their stock or stop dairying. 3. Not determine

35. Which one is your major challenge in your dairy farming?

1. Cost of production: Due to severe shortages of animal feed supplies in different seasons, the cost of running a dairy farm is expensive

2. Demand side: Low Consumption behavior during fasting and non-fasting period against dairy products consumption.

3. Management: Lack of modern animal husbandry and management,

4. Prevalence of animal diseases and inadequate access to veterinary drugs and services

5. Mention if any others----------

Appendix II: Household survey questionnaires for café, Bar and Restaurants

Gondar University: Marketing Management Analysis of Dairy Marketing Chain; in the Case of Gondar Town and the nearby *Kebeles*, Northwest Ethiopia.

Dear respondent,

This household survey questionnaire aimed at to investigate dairy marketing chains; in the case of Gondar town and the nearby selected *kebeles*, northwest Ethiopia. Therefore, your active participation and genuine responses is very crucial in meeting the intended objectives of the study. I kindly request your active cooperation in responding to the questionnaires.

Thank you!

Case Study Questionnaire

Region-----Adm.Zone----------Peasant Association----------

I**. Personal Information**

1. Household head:- **Sex**: 1.Male----; Female-----; **Age:** ---- **Education status**:----------

2. Family size and educational status

Age group	male	female	**Total**
<10			
11 up to 20			
>21+			

Educational grade	male	female	**Total**
illiterate			
1-4			
5-8			
9-10			
11-12			
Diploma & above			
total			

3. Marital status A. Single C. Divorced

B. Married D. Widow or widower

4. Religion: A. Orthodox B. Protestant C. Muslim D. Catholic E. Other (specify------

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II. **Organizational activity of dairy marketing**

1. Date of establishment of your business_____

2. What was your reason to engage in dairy trading? _____

3. Type of market information sources for your Butter and Milk access of production?

1. Personal visit 2. Friend/other traders 3. Consumers/customers

4. *Woreda* agricultural office staffs

4. What are your Primary purposes of milk and butter trading?

1. For sale 2. For consumption 3. For both sale and consumption

5. Amount of estimated average purchasing and selling (profit) milk and butter price per letter

Items	Purchasing		Selling	
	Amount per day in litter	Price per litter in birr	Amount per day in litter	Price per litter in birr
milk				
butter				

6. From whom do you source your local milk and butter demanded?
1. Monthly contract from producers 2.cooperative 3.shop (powder milk) 4. Open market point

7. What are the Factors considered in selling price setting of milk?
1. Distance from milk market 2. Quality of milk 3. Supplier preference 4.Price of milk
5. Season of demand and supply 6. If any other, mention----------

8. Factors considered in butter price setting
1. Distance from butter market 2.Quality of butter 3. Consumer preference 4.Price of butter
5. Season of demand and supply 6. If any others, mention----------

9. Mean marketing costs/litter of milk and /kg of butter?

Items	**Cost of items (Birr)**		
	Transport cost	Labor cost	Tax paid
milk			
butter			

10. What are your Primary selling outlets of milk & butter production?
- Direct to consumers 2. Semi-whole sellers 3. Whole sellers

11. Butter and milk traders purchasing and producers selling strategies is based on
1. Negotiation 2. Market 3. Producer 4. Buyer

12. Which one is your major challenge in your milk and butter marketing?
1. Cost of milk and butter
2. Demand side: Low Consumption behavior during fasting and non-fasting period against dairy products consumption.
3. Supply side: low supply during dry season
4. Mention if any others----------

APPENDIX III

- **Questions Interview for key informants/FGD**

Technical Services

1. What kind of technical services and advice?

2. How do you deliver the technical service (outsourced or your own field staff)?

3. Any improvement in farmers practices to technical services activities?

4. Are there any quantity, quality, continuity issues of the supplies? 1. Yes 2. No

5. How do you communicate your purchasing/product quality criteria to farmers?

6. Do you have any quality incentive program and how response from farmers to the program?

Financing Arrangements

7. How do you finance the purchase of local milk supplies? (Overdraft, bank loan, internal company funds) – do you use any intermediaries to facilitate this?

8. Do you have any problems in financing local milk supplies? If yes, please explain.

Production Issues (for dairy farmers)

9. What is the product specification that you require from your suppliers?

10. What is the price ranges paid to your farmers for various milk qualities?

11. What are the main problems facing farmers?
    - The management of water and livestock feeds during the dry season
    - Availability of power for cold chain and water heater
    - Level of nutritive quality of feed
    - Level of standard farming practices covering feed management, farm hygiene management
    - Water and feed supply constraints
    - Purchase of dairy cows
    - Costs and profitability
    - Others, and
    - What supports you need most and from where you expect?

12. How you evaluate the prevailing of dairy production system in the area so as to the sustainability and productivity of milk and butter production?

13. Is there a dairy farming management committee? What is its role? How effective is it? How is it elected?

- **Case Study Questionnaire interview for cooperatives**
  - When your dairy cooperative business was established?
  - How many household members are there in your cooperative organization?
  - In what way the cooperative agency is established (regarding of sharing capital, sharing of responsibility, management, and etc)?
  - Where did you get your milk supply sources and how much you have collect per a day?
  - Do you have processed your milk to produce butter? 1. Yes 1.no
  - If yes in what way?
  - How much did you get your profit on average per a month from milk and butter?
  - What are your major problems of the business?

- **Interview For consumers**

  1. Have you ever used milk and butter?

  2. Where did you get your milk or butter supply regularly and how often you are use it?

  3. Did you have get milk and butter when you want any time?

  4. What do you say about the quality and quantity of milk and butter supply?

  5. What do you say about the general supply and demand of milk and butter in your town?

  6. If there is a mismatch between supply and demand, how can to improve the system and who is the key responsible body to rehabilitate?